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Causes and Consequences of Police Militarization

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Abstract

After the 2014 shooting of Michael Brown, and many other incidents of police violence that followed, the militarization of policing and the use of violence by police became the subjects of contentious debate among the public, policymakers, and scholars. Research on these subjects necessary to inform the debate has been lacking. This work examines the causes and effects of police militarization in the United States. Specifically, I argue that militarization is a response to perceived threat from minority racial groups, but the relationship between racial demographics and militarization is curvilinear. Militarized begin to see themselves as soldiers fighting on the front line of a war rather than public servants, which causes goal divergence between the public and police. Although the public expects police to only use lethal force in extreme circumstances, militarized police use lethal force against civilians more quickly, resulting in more civilian deaths. Police departments should respond to more frequent civilian deaths by implementing policy solutions, such as body-worn cameras, that theoretically allow for easier monitoring of police behavior and overcome the principal-agent problem.

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Chapter 1

Introduction

In August, 2014, a police officer in Ferguson, MO, outside St. Louis, shot and killed 18 year old Michael Brown, who was unarmed and reportedly had his hands in the air when the officer shot him multiple times ("Angry crowd gathers after Missouri police shoot teen" 2014). Protesters took to the streets after the shooting to demonstrate their disapproval of what they seemed to believe was an incident of excessive force by a police officer. Later, a grand jury refused to indict the officer for any crimes (Desmond-Harris and Lind 2014). Even now, five years later, the details of what precipitated the shooting remain unclear, but the incident brought the topics of police militarization and use of force to the forefront of public discussion. Michael Brown's death inspired a national movement advocating police reform (Sanburn 2014).

Other incidents of police officers killing civilians under questionable circumstances amplified and prolonged the controversy. Though they are, at this point, too numerous to name each of them, it is worth recognizing several especially prominent victims of police violence. In North Charleston, SC, an officer initiated a traffic stop in April of 2015. The driver was Walter Scott, driving a vehicle with a broken tail light. Scott ended up outside of the vehicle; according to the video recording of a bystander, Scott tried to run from the officer before the officer fired his weapon at Scott eight times. Scott died at the scene (Shoichet and Cuevas 2015). In an unusual turn of events, the officer pleaded guilty to violating Scott's civil rights in federal court after a mistrial for murder in state court, and received a 20-year sentence.

Also in April, 2015, Baltimore police arrested 25 year old Freddie Gray who ran from

police on sight despite not facing any current charges. Somehow, between arrest and arrival at the police station, he suffered severe spinal injuries that killed him several days later (Graham 2015). All involved officers either received acquittals at trial or had their charges dropped. The Justice Department refused to bring federal charges.

In March, 2018, police in Sacramento, CA, responded to a call of a suspect breaking car windows and confronted a man initially spotted by a police helicopter. Stephon Clark, 22, tried to run but stopped quickly in the back yard of the house he stood near. Following police orders, he raised both hands and turned around. One officer yelled that Clark had a gun, and officers fired 20 shots at him. Eight hit, and Clark died on the scene. He was holding an iPhone in one hand, which police mistook for a gun (Chavez, Egel, and Chabria 2018). The Sacramento County District Attorney decided not to charge the officers.

After each of these citizens, protesters and reform advocates alleged racial bias among police and accused police of becoming too militarized and, as a result, too quick to violence. The debate presented what should have been an excellent opportunity for political science scholars to contribute their knowledge of policing, race, bureaucratic discretion, the use of state institutions to promote racial division, and other subjects to the public debate. Unfortunately, such a contribution did not happen. Despite a few notable exceptions (such as, for example, Brehm and Gates (1993), Wilson (1978), and Wilkins and Williams (2008)), political science as a discipline largely ignored issues related to policing. Instead, policing, and especially militarization, research was the domain of criminologists and sociologists, who produced respectable work but did not have the interest or training in the political factors that could influence or explain police behavior.

Fortunately, this trend changed in the years following the Michael Brown shooting. Research appeared that connected police militarization with the number of civilians police kill (Delehanty et al. 2017; Lawson 2019). Others examined the effects of minority representation on public attitudes toward police (Hong 2017b), on minority citizen deaths (Nicholson-Crotty, Nicholson-Crotty, and Fernandez 2017), and on racial profiling by po-

lice (Hong 2017a). Additional work contributed to developing frameworks for studying race and policing from a public administration and public policy perspective (Rivera and Ward 2017). In a scathing critique, Soss and Weaver (2017) call the entire subfield of American politics to task for its often narrow focus on the trappings of democracy such as political parties and elections, leaving out potentially unpleasant topics such as race-based oppression and marginalization.

This dissertation contributes to addressing the problem that Soss and Weaver (2017) identify. By providing a theory that addresses both the causes and consequences of militarization, I hope to stimulate a scholarly discussion of often-ignored institutions and phenomena such as policing in general and militarization specifically, the interaction between race and policing, and the potential to minimize the negative consequences of both. I use newly-available datasets from a variety of origins, such as crowd-sourcing and Freedom of Information Act requests, and a theory that combines aspects of political science, public administration, sociology, criminology, and social psychology to answer questions that were likely unanswerable in the past.

In Chapter 2, I provide a definition and theory of militarization, along with descriptions of unique datasets I use in the analyses that follow. Chapter 3 examines the causes of militarization, describing militarization as a police response to increase threat from minority communities. I further adapt theories of critical mass to predict a curvilinear relationship between race and militarization. Chapter 4 expands on this work by examining how militarization affects the frequency with which police kill civilians within their jurisdiction. Chapter 5 presents an argument, rooted in social contract theory, that militarized police and the public experience a principal-agent problem. Militarized police kill more people, but citizens expect police to use a minimal level of force necessary to achieve their goals–even if those goals include maintaining a racial hierarchy. Local governments should pursue policy changes to mitigate that principal-agent problem, resulting in fewer deaths in the future. Chapter 6 offers some conclusions.

Chapter 2

A Theory of Militarization and Operationalization of Major Concepts

2.1 Introduction

The militarization of American police became a hotly debated topic after the 2014 shooting of Michael Brown in Ferguson, MO, and several other similar, high-profile incidents that followed. While there appears to be a consensus that police are becoming more militarized, scholars of political science and public administration have paid relatively little attention to the phenomenon until recently (for some notable examples, see Wilkins and Williams (2008); Wilson (1978)). The study of policing was typically the domain of criminologists rather than scholars of politics, despite the obvious political implications of police work. In addition, the study of police militarization specifically suffered from several glaring issues. The first is a lack of usable data for quantitative analysis. Potential measurements of militarization–the acquisition of military equipment, the presence of a SWAT team, the frequency and types of SWAT team deployments, and so on–were difficult or impossible to obtain, leaving scholars with no choice but to study policing in a qualitative style, focusing on descriptions of a small number of agencies. The second is the lack of a consensus regarding what militarization *is*. Without a coherent definition of militarization studying it is essentially impossible. Moreover, without a definition of militarization it is impossible to construct a theory that explains its causes and effects. In this chapter, I define militarization, provide an overview of my theoretical arguments, and discuss the ways I will measure important concepts.

2.2 Defining Militarization

Despite the greater attention given to militarization by criminal justice scholars, there is still no broadly accepted definition of the term (Bieler 2016). Prior literature proposes several possible definitions. Some scholars point to organizational characteristics as ways to define militarization. Early research on militarization looked to the expansion of Special Weapons and Tactics (SWAT) teams from their origins as a specialized team trained in the use of heavy force for rare situations outside the ability of rank-and-file officers, such as hostage situations (Kraska and Kappeler 1997). These teams began in police departments in the largest American cities, but eventually expanded to small and mid-sized towns and cities despite the lack of any observable need due to crime levels (Kraska and Cubellis 1997). Along with their geographic expansion, SWAT teams also became more proactive. For many, these teams represented the growing militarization of police (Balko 2006; Balko 2013; Weber 1999) due to operational and cultural similarities. SWAT teams train for a mission primarily based on the use of force (Kraska and Kappeler 1997) and have strict discipline (Jefferson 1990; Kraska and Paulsen 1996). However, using SWAT teams as a definition of militarization leads to some problems. First, these teams are only a subset of police officers within a department. It seems difficult to justify measuring a concept that describes an entire agency based on a few members. Second, that most police departments have some form of SWAT team presents difficulty due to few agencies being without such a team. According to the 2013 Law Enforcement Management and Administrative Statistics, a nationally-representative survey of law enforcement agencies, only about 15% of police departments do not have a SWAT team. Finally, there is no repository of SWAT team data to facilitate study. Researchers would have to collect data by agency, making such a project considerably daunting.

Other scholars point to easily observable phenomena such as carrying rifles while on patrol (Phillips 2016), wearing military-style uniforms (Bell 1982; Bickel 2012), the use of military ranks and insignia (Maguire and King 2004), and the use of command and con-

trol centers (Kraska 2007). Others expand on these suggestions to define militarization as the acquisition of military-style equipment or cross-training and operational collaboration between the police and the military (Balko 2013; Haggerty and Ericson 1999; Weber 1999). There is evidence that weapons can cause aggressive behavior (Berkowitz and LePage 1967; Turner, Layton, and Simons 1975; Carlson, Marcus-Newhall, and Miller 1990). In addition, the use of military tactics and equipment can increase the level of violence in a disturbance (Jefferson 1993), but other work suggests it leads to a reduction in violence (Waddington 1993). These hardware-based definitions may be easier to measure, but they present theoretical challenges regarding how militarization affects officer behavior when not all officers get access to such equipment.

There are also conflicting ideas over the possible operational characteristics of militarization. Does militarization involve strict discipline, closely following rules (Bittner 1970), little flexibility, and reluctance to show initiative (Guyot 1979)? Or does militarization involve the encouragement of initiative and creativity at all levels (Cowper 2000)? A useful definition of militarization must overcome these difficulties and provide a useful conceptual framework for what militarization is and what it is not.

To define militarization, I begin with the concept of militarism. This is a system of values or beliefs that emphasize the use of force as an effective, acceptable, and desirable way to solve problems (Adelman 2003; Klare 1978; Kraska 1996; Kraska 2007). Militarization, then, is a process through which police increasingly adhere to militarism. In other words, when police militarize, their individual and collective psychology increasingly adopts the view that violence solves everything. They see themselves as soldiers fighting on the front line of a war, outnumbered, out-gunned, and responsible for occupying what they see as dangerous enemy territory. A soldier's job is to confront, fight, and destroy the enemy. It is not to engage in public service. Thus, more militarized police officers should see bureaucratic functions such as providing public goods and services to be secondary to fighting against their enemy. In the case of police, however, the "enemy" are the citizens within the

agency's jurisdiction, or a subset thereof.

Militarization, then, is both philosophical and cultural. It "begins," so to speak, with a philosophical transition among police agencies and officers from preferring less violence to preferring more violence. Or, alternatively, it is a transition that involves the use of violence to solve problems police encounter becoming more acceptable and even more desirable. The philosophical change begets the cultural change. When the philosophical foundation of policing emphasizes violence as desirable, the culture of police within an agency shifts as well. Given the strength of socialization within police departments (Armacost 2003), militarization spreads to all officers within an agency, transforming the agency's culture to one that not only glorifies violence philosophically but also engages in more frequent and severe violence in the field. Police that seem themselves as soldiers fighting a war want to look and act like soldiers fighting a war. Thus, philosophical and cultural changes lead to observable behavioral changes.

However, those behavioral changes alone are not necessarily militarization but signs of it. Prior definitions and measures of militarization, such as SWAT team deployments, military-style uniforms and ranks, and the acquisition of military equipment, though frequently labeled as "militarization," are simply some possible manifestations of militarization that scholars and the general public can easily observe. They are not militarization. In a hypothetical world where data limitations do not exist, scholars interested in studying militarization would be able to conduct surveys of police officers asking questions regarding attitudes towards the use of force and the overall mission of police. Militarized officers would be enthusiastic about using violence, and they would see no problem with using violence earlier, more often, and more severely than less-militarized police. The officers would express beliefs about their job in terms of warfare and/or occupation, where they are surrounded by a hidden and dangerous enemy and must keep tight control over a subjugated population, like soldiers in hostile occupied territory. As those officers become more militarized, they would express these attitudes about violence and the job of policing with

greater enthusiasm. Unfortunately, this hypothetical world does not exist, and scholars, especially scholars of policing, must contend with data limitations. I discuss the specifics of my measure of militarization below, but to be clear: my argument is not that observable manifestations of militarization *are* militarization. Militarization is a characteristic of police department and officer psychology.

In the next section, I provide a brief overview of my theory of militarization, explaining the causes and effects that I test in later chapters.

2.3 A Theory of Militarization

It is likely not controversial to state that a racial hierarchy with Whites in the dominant position is an important part of social organization in the United States, or that government institutions in the United States play a role in reinforcing that hierarchy (Michener 2017; Pettit and Western 2004; Sharkey 2013). The police are a part of that process. As an institution of government, the police role is to maintain public order (Wilson 1978). They capture people who disrupt that order and separate them from the rest of society. Within a society based on racial hierarchy, maintaining order means maintaining the hierarchy. To facilitate this role, the public empowers police with significant authority and discretion. Although police are street-level bureaucrats (Lipsky 1980), their power is considerably greater than others. Police frequently must make quick decisions in what may be life-or-death situations (Wilson 1989), so a degree of discretion is necessary to perform this function.

Within a racialized society like the US, relationships between racial groups is the product of their relative position with regard to areas of public life such as the economy and politics (Giles and Hertz 1994). As minority groups improve their competitive position, the dominant group reacts with greater hostility (Blalock 1967; Dollar 2014). In fact, the threat does not even have to be real: the dominant group only needs to perceive a greater threat for hostility to increase (Bobo and Hutchings 1996; Kinder and Sanders 1996). Because police are agents of government, and government is an agent of the dominant racial group,

police act as agents of that group by supporting the dominant position of Whites at the top of the hierarchy (Jacobs and Helms 1997). There is already a robust literature on the effects of racial threat generally on White behavior (Enos 2016; Giles and Buckner 1993; Hopkins 2010; Tolbert and Grummel 2003) and specifically on police activity (Alpert and Dunham 2004; Correll et al. 2007). I argue that militarization is simply another mechanism through which police help maintain the racial hierarchy. The combination of "law and order" politics and "broken windows" policing led to an influx of resources to police agencies and a shift of blame for crime onto the communities experiencing it (Soss and Weaver 2017). As a result, police began to see minority populations as a dangerous enemy and themselves as soldiers fighting on the front lines of a war to protect public order from disruption. In other words, where minority communities are larger, police militarize more.

Of course, Black-White racial tension and the use of state institutions, such as police, to enforce racial divisions are not new phenomena in the United States. Although militarization as a concept became salient only recently, the mechanisms that drive militarization existed throughout US history. However, before the appearance of professional police forces, responses to increased racial threat were carried out by members of the White population, usually on an ad hoc basis. Government institutions in the US mostly lacked the capacity to maintain racial divisions, so private citizens had to do so themselves (Epperly et al. forthcoming). Over time, the use of these overtly racist, oppressive tactics by groups of private citizens lost political acceptability. Professional police, as agents of the state, enjoyed the appearance of legitimacy and broad behavioral discretion that allowed them to maintain the racial hierarchy.

There is a long history of police acting to repress racial minorities in the US. But with the rise of "law and order" politics and "broken windows" policing provided both the resources and theoretical framework to facilitate modern militarization. Demands for law and order resulted in greater financial resources and manpower that facilitated the operational shifts brought about by broken windows. Rather than patrolling set areas, police would

flood "problem" areas, most of which happened to be predominantly minority, and punish any infraction they found. Sweeping minority communities in large numbers created an association between minority groups and crime, and put police into the position of an occupying force in those communities. That association, and the operational shifts, contributed to the psychological process of militarization.

Greater militarization results in a greater emphasis on the use of force as an acceptable or desirable way to confront problems. Due to their significant discretion (Lipsky 1980), police officers can determine how to interact with civilians. When approaching a suspect, we might think of the range of possible actions an officer may take as a continuum ranging from least to most violent (Worden 2015). Within that range is a subset of options the officer believes to be appropriate for the current situation. The officer chooses an initial action from that subset. If the suspect complies, the process ends. If the suspect resists, the officer escalates by choosing new actions moving toward the more violent end of the continuum. This iterative process continues until the suspect complies (Alpert and Dunham 2004). Militarization changes this process in one of three ways. First, it may move the window of acceptable actions toward the more violent end of the continuum. Second, it may move the officer's initial choice within that window toward the more violent end. Third, it may do both. In either case, the result is the same: police officers begin with more violent actions and reach lethal force more quickly, which results in more civilian deaths.

The public may view excessive civilian deaths as a violation of a social contract between themselves and the police (Pettit 1997; Shapiro 2003). The public expects police to use force only when necessary and only in the least amount necessary (Alpert and Smith 1994). However, because militarization leads police to see violence as an acceptable solution, and because it leads police to kill civilians more often, the public perceives a violation of this contract. This is a principal-agent problem (Miller 2005): citizens, the principal, expect the police, the agent, to pursue the citizens' goals, which are to maintain public order with a minimum of violence. Violating the social contract by using excessive force causes tension

between the public and police (King and Waddington 2004). The public should demand political leaders pursue policy changes to enhance the public's ability to monitor and punish police for unacceptable behavior.

The most popular recent policy suggestion for accomplishing this is body-worn cameras, devices police officers wear to record video and audio of interactions with civilians (Friedman 2014). Video cameras offer the ability to have an objective, third-party perspective of police-citizen interactions. The use of these cameras should alter police behavior through two mechanisms: increased self-awareness (Duval and Wicklund 1972; Gervais and Norenzayan 2012) and deterrence (Nagin 2013; Von Hirsch et al. 1999). Self-awareness makes police officers focus on their own behavior more, which should produce more socially desirable behavior such as reducing how often and how severely officers use force. Deterrence forces officers to believe that the chances of being caught engaging in unacceptable behavior are higher (Klepper and Nagin 2006). This results in changes in behavior to avoid punishment. Therefore, when the public demands its leaders implement policy solutions to constrain police behavior, body cameras are a likely choice. Furthermore, adopting body cameras should also reduce the frequency of civilian deaths.

The chapters that follow develop this theory in more detail and test the associated predictions. In the next sections, I describe how I measure the two most important concepts in those following chapters: militarization and civilian deaths. Due to the limited availability of useful data for examining these questions, I obtain the best data available. Descriptions of the sources and nature of these data follow.

2.4 Measuring Militarization

Militarization is a somewhat nebulous concept (Wickes 2015) as it involves the psychological state of officers. Kraska (2007) suggests four dimensions of militarization: material, cultural, organizational, and operational. The material dimension focuses on the acquisition of military weapons and equipment by the police and offers an objective way to measure,

if indirectly, a potential effect of militarization. The specific policy I use to capture this concept is the federal "1033" program, which allows federal, state, and local law enforcement to acquire surplus military supplies and equipment. In 1997, Congress made the program permanent and expanded its scope to include counter-terrorism (Bailey Grasso 2014). Agency officials may browse an online database or visit warehouses in person to peruse the available equipment, and agencies pay only the cost of transport. The equipment itself is otherwise free of charge (Molina 2014). Figure 2.1 depicts the total dollar value of hardware that law enforcement agencies received over the period of analysis. Interestingly, the total amount is relatively stable over this time period.

I obtained data on 1033 program transfers through a Freedom of Information Act request to the Defense Logistics Agency. DLA maintains a list of all currently outstanding transfers to law enforcement agencies, which updates each quarter. Prior to 2014, however, DLA did not maintain records of past quarters. Agency officials updated and replaced the quarterly database without saving old versions. Beginning in the fourth quarter of 2014, DLA began to save old versions of this database.

The Defense Logistics Agency divides equipment into two broad categories: controlled and non-controlled. Controlled items–such as weapons and vehicles–remain the property of the Department of Defense permanently, with law enforcement agencies essentially receiving a license to use this equipment indefinitely. Non-controlled items–such as clothing–remain Defense Department property for one year, at which time the items become the property of the agency and DLA removes the items from the quarterly database. I have no way of knowing if non-controlled items that drop out of the data did so because the agency returned the items to DLA or because the items reached the one-year point since transfer and became that agency's property. Because of this, I limit the militarization variable to only controlled items using DEMIL codes assigned to each item, which specify which items require certain modifications before transfer per federal policy and, thus, which items constitute controlled versus non-controlled. A large majority of items agencies receive through

the 1033 program are controlled. The dataset includes more than 1.78 million items. Removing non-controlled items reduces this number by about 430,000, leaving around 1.35 million items.

The 1033 program data includes only the date DLA sent each item to the agency. It does not include the date of initial purchase. So while I adjust for inflation from the ship date, it is likely that this adjustment does not fully capture the value of the item at initial purchase. However, this likely makes the results more conservative, as they will underestimate the militarization that these items represent.

I constructed a militarization variable that accounts for military equipment in a law enforcement agency's possession from 2014 through 2016. In Chapter 3, I use the average annual dollar amount of 1033 equipment as the dependent variable. In Chapter 4, I keep the measure at the agency-quarter level. I focus on the amount of military equipment law enforcement agencies receive from the Department of Defense as an appropriate measure of police militarization, as it explicitly reflects at least part of a cooperative relationship between the military and police. I use data from the Defense Logistics Agency which provides an itemized list, by agency and date, of all such equipment. However, a simple count of the number of items is insufficient to properly capture the concept of militarization. If military equipment represents militarization, different types of equipment likely represent varying levels of militarization. An armored personnel carrier provides a much more striking image than a pair of combat boots. A military rifle is likely somewhere in between, and probably represents a greater level of militarization than an infrared sight. In other words, larger, more high-tech or intimidating equipment should represent more militarization than smaller, low-tech, generic items, and should also be more expensive. I use the dollar value, adjusted for inflation, of each item as a measure of the militarization that item represents.

It is worth emphasizing that my argument is not necessarily that the 1033 program itself causes an increase in the use of lethal force. Rather, psychological and behavioral changes in police officers cause an increase in the use of lethal force and in the number of suspect

deaths. I argue that the 1033 program is a proxy measure that captures the psychological process of militarization. Militarized police departments should request more–and more expensive–military equipment in order to better carry out their perceived goal of fighting against criminal elements. There is evidence that the 1033 program leads to decreased crime (Bove and Gavrilova 2017; Harris et al. 2017). But like many public policies, there may be negative consequences associated with their implementation. It seems uncontroversial to suggest that the 1033 program probably has some desirable effects with respect to crime control. It also seems uncontroversial to suggest that knowledge of any negative associated consequences is important as well.

In a study similar to my own, Delehanty et al. (2017) find that militarization, represented by 1033 program transfers, corresponds to an increase of lethal force incidents. However, they use a sample of only four states and aggregate both suspect deaths and militarization to the county level. Aggregating measures to the county level could lead to incorrect results as the model loses differences between police agencies with sub-county jurisdiction. Some agencies likely receive more than others, or some likely receive more valuable equipment than others, and aggregating to the county loses that variation. Police departments with sub-county jurisdiction perform most policing functions, and there are substantially more of these departments than those with county-wide jurisdiction, such as sheriff's offices. Losing such variation seems quite problematic, so I leave my own data at the agency level.

2.5 Tracking Civilian Deaths By Police

The August, 2014, shooting death of Michael Brown by a Ferguson, MO, police officer ignited a firestorm of controversy over police behavior reminiscent of the public backlash that followed the 1991 beating of Rodney King by and 1992 acquittal of officers of the Los Angeles Police Department. The mysterious circumstances surrounding Brown's death, the violent police reaction to the protest that followed the incident, and a series of additional high-profile police killings around the United States–such as the 2016 shooting death of

Philando Castile in Minnesota, the 2018 shooting death of Stephon Clark in California, and others–fostered contentious debate and increased the salience of the issue of police use of force.

The debate over the use of force from 2014 to the present also sounded similar to the debate over the Rodney King assault. Those arguing police acted inappropriately made claims of racial bias–individually, against the police officers themselves, and structurally, against the police department and the broader criminal justice system. On the other side, police advocates stressed that police use force rarely and only when absolutely necessary, disavowing any possibility of racism playing a factor in police behavior. The controversy, it seemed, was well-suited to examination by social scientists to determine how frequently police kill civilians, the racial composition of civilians killed by police, and other potentially important questions with obvious real-world implications. Moreover, policing should be an important topic to scholars of public administration because, often, the police are the only public administrators the public knows (Soss and Weaver 2017). Police operate in the field among citizens, rather than in a designated office, frequently come into contact with citizens, and, unlike other bureaucratic actors, have the state-sanctioned authority to deprive citizens of basic civil rights up to and including the right to life. Ultimately, police are the public face of the state's ability to coerce and control citizen behavior (Smith 2015).

The problem social scientists face in attempting to study policing, and likely the biggest reason for the relative lack of scholarly work, is that data necessary to facilitate even the most foundational analyses do not exist in any official sense. Essentially all existing scholarship on policing involves data collected by the researcher(s) themselves and usually include only a single agency. In particular, scholars, journalists, and others who wanted to find out information such as how often police kill civilians or the racial demographics of civilians killed by police found that those data were not available from any government source.

One might expect that tracking civilians killed by police would be an obvious necessity

to provide transparency and improve public trust in policing. After all, there is a tremendous amount of government-collected data on a multitude of topics, all publicly available. However, despite some recent attempts by federal officials[1] and scholarly calls to treat police killings as a public health issue that requires reporting similar to the reporting of disease (Krieger et al. 2015), there remains no single, federally-sponsored database of police killings. The US Department of Justice announced in 2016 that it would begin requiring police departments to report details of police killings each quarter under the authority of the Death In Custody Reporting Act, which represents the most concrete government effort to collect these data, but the degree to which agencies comply with this requirement and the accuracy of reported data remain to be seen. The reasons for this lack of data are largely unknown, but we can speculate on what some of them might be. Thanks in part to the rise of law and order politics in the 1970s, which emphasized the need for increased police power and resources to confront a growing epidemic of crime across the country, laws regarding police violence–and the public's tendency to trust the judgment of police officers with little to no question because they are, after all, "[City Name]'s Finest"—potentially preclude the need for tracking such information.

The decentralized nature of policing in the United States could also plausibly contribute to a lack of data. There are roughly 11,000 law enforcement agencies, the vast majority of which operate at a local level–either county-wide agencies such as sheriff's offices or sub-county police departments. Collecting data on police killings would require the labor-intensive task of soliciting it from each of these agencies. Moreover, there would be no way to verify the accuracy of received data or to require agency compliance with the request.

Still, scholars have made attempts to find usable data to study police use of force generally and the killing of civilians specifically. One option is the FBI's annual Supplementary Homicide Report (Smith 2003), which collects agency-level information about all homi-

[1] https://govtrackinsider.com/there-is-no-federal-database-of-shootings-committed-by-law-enforcement-1a029bb350d2

cides by agency and year. The data from this report are problematic for two reasons. First, the reports include only justifiable homicides by police officers, considering unjustified homicides to be murder and thus combining unjustified police killings with murder statistics that cannot be separated. This both potentially reduces the reported number of civilians killed by police and makes the study of unjustified killings, specifically, impossible.

Second, the FBI relies entirely upon voluntary reporting to collect the information necessary for the reports. This results in large amounts of missing data. For example, from 1988-2016, Florida reported data for the Supplemental Homicide Report only in 1992-1995[2]. If these missing data are not random–and random missing data seems like an unrealistic assumption in this case–results of analyses could be biased.

Another possible source is the National Vital Statistics System, which collects data on multiple topics from state governments including deaths, and the associated National Death Index, which contains the same mortality data as NVSS. These data are also problematic for several reasons. First, like the FBI's UCR data, they also depend upon voluntary contribution, though the contributions are from state vital statistics registries which, in the case of deaths, use death certificates and reports from medical examiners or coroners to code the cause of death. Though this system removes police agencies themselves from the decision of whether to contribute data, it could still potentially lead to missing or incorrect information due to administrative errors, illegible handwriting on reports, or misinterpretation of those reports.

Second, it is not possible to simply request data on all subjects with a specific cause of death. Researchers must know, in advance, one of three sets of information about a person for which they are requesting death records: first and last name and social security number; first and last name and month and year of birth; or social security number, full date of birth, and sex. This requirement, on its own, makes the construction of a database of police

[2]Florida is the only state that does not participate in submitting data to the Supplementary Homicide Report at all. Data that would otherwise be included are available through the Florida state government.

killings impossible, because the researcher must know identifying information about each victim in advance.

Third, NDI data are neither publicly nor freely available. Access to these data are restricted and require an application and 2-3 months of processing time for approval. The application process requires documentation of Institutional Review Board approval for a specific study, a physical CD that includes a text file containing information about each subject for which the researcher is requesting records, and a check for the cost of these records— the researcher is required to calculate on his or her own. The cost depends on the information sought. Each submission carries a mandatory $350 service charge, plus an additional charge of 15 cents per subject per year searched for a "routine" NDI search that states only whether the subject searched is deceased, or 21 cents per subject per year for "NDI Plus," which also provides cause of death codes. And, despite the difficult process for obtaining data, some recent evidence suggests that using the NDI for any study of police killing of civilians will be unreliable due to significant under-reporting (Feldman et al. 2017).

In sum, the study of police killings is difficult or impossible because official data on the topic, for whatever reason, do not exist. Thanks to the drastic increase in the salience of police violence both among scholars and in the public, other actors have begun attempting to circumvent this limitation using crowdsourcing to gather data that would otherwise be impossible for one person or a small group to gather. In the next section, we discuss one such project: Fatal Encounters.

2.6 Fatal Encounters: Crowdsourcing Civilian Deaths

Fatal Encounters is the brain child of B. Brian Burghart, former editor of the Reno News and Review in Reno, NV, journalism instructor at the University of Nevada, Reno,

and now the founder and executive director of Fatal Encounters[3]. His interest in police killings is a familiar story: learning of a nearby incident where police killed a man during a confrontation after the man stole a car, he had questions about how often police kill civilians and found that no such database exists. In 2013, he created Fatal Encounters, a project with the ambitious goal of collecting information–not just names, but race, sex, age, location of incident, cause of death, etc.—about civilians killed by police from January 1, 2000, to the present.

Fatal Encounters began with Burghart sending Freedom of Information Act requests to the FBI for information on police killings, but that strategy proved unsuccessful. Eventually the project grew to include a group of volunteer data collectors and, after receiving donations from the public and a grant from J-Lab: The Institute for Interactive Journalism, Fatal Encounters also involved researchers paid on a per-record basis.

The data collection process is fairly straightforward and is the same for paid contributors as well as volunteers. Researchers select one or more states for which they will gather data. Information comes primarily from news media reports on police killings, from sources such as the online archives of local newspapers and TV news agencies, but researchers also use Freedom of Information Act requests (or the particular state's equivalent) to law enforcement agencies. Upon finding a relevant incident, researchers record as many of the following as possible: subject's name, age, race, sex, and picture; the date of the injury that led to the subject's death; the address where the injury occurred including address, city, state, and zip code; the specific agency responsible for the death[4]; the cause of death (gunshot, vehicle, etc.); a brief narrative description of the incident; the official ruling of

[3]www.fatalencounters.org

[4]Initially, researchers recorded all agencies involved in the incident. This led to, in some cases, the reporting of multiple police departments which rendered determining which agency actually caused the death impossible.

the incident (justified, not justified, suicide, etc.)[5]; a link or citation of the source of the information; and whether police were aware of symptoms of mental illness or drug use[6]. Fatal Encounters interprets police killings broadly: the database includes suicides during confrontations with police, whereas other databases do not.

Once collected, the researcher records this information in a Google spreadsheet designated for a particular state and year. For example, an incident in Los Angeles, California, in August of 2012 would be entered into the spreadsheet for California in the year 2012. These preliminary databases are not publicly available. Before addition to the public database, each record goes through a fact-checking process to verify the information provided to prevent vandalism and strengthen credibility. After verification, the record receives a unique identifier number and joins the public database. Each record in the database is an individual person, so an incident in which police kill more than one person will appear as more than one record in the database rather than a single incident.

The most recent revision of Fatal Encounters, July 22, 2018, contains over 24,000 records from all 50 states and Washington, DC, from January 1, 2001, to the present. Aggregating the total number of records by state results in a range of 26 (Rhode Island) to 4,140 (California) with a mean of 479 and a median of 336.5. Over time, states vary in civilian deaths from slightly more than one per year (again, Rhode Island) to around 218 per year (again, California).

Aggregating the database by race results in a range of 40 (Middle Eastern) to 7,536 (White) with a mean of 3,113.6 and a median of 1,725.5, though 8,585 are reported as "race unspecified," indicating that the researcher(s) were unable to determine the race of the subject. There are 5,057 Black subjects, which seems to support the common claim that

[5]Although, because media reports typically do not follow up on incidents, many of the dispositions are recorded as unknown.

[6]It is worth mentioning that the Fatal Encounters data specifically list this item as not suitable for analysis, likely due to the difficulty of determining what police officers new in advance of an incident.

Black people are over-represented in police killings.

Annual deaths range from a low of 816 in 2010 to a high of 1,782 in 2013 with a mean of 1,186 and a median of 1,255. Overall, the total number of deaths seems to trend upward over time. There is, however, one necessary caveat: the use of media reports to compile data on police killings likely means that older incidents are more difficult to find, so the trend may be the result of the difficulty of finding older information versus newer. Still, it is worth mention that, of all current projects to collect data on police killings, Fatal Encounters is the only one that even attempts to gather information from as far back as 2000.

Validity and reliability are an obvious concern for crowdsourcing data. Fatal Encounters' fact-checking process is meant to address both, requiring an additional verification process of all information submitted before addition to the public database. In addition, while reliance on media reports risks omitting incidents for which there was no media coverage or media coverage is difficult to find, such as with incidents from farther in the past, the use of government records can alleviate this concern at least to some degree by facilitating the discovery of police killings that a media search missed. Finally, a recent comparison of three police killings databases–Fatal Encounters, a database by Deadspin, and a database by the Washington Post–determined that records were consistent across all three (Ozkan, Worrall, and Zettler 2017). While this study only considered reported incidents in Dallas, TX, and while Fatal Encounters includes a much longer time period, it is still some evidence that these sources are not biased with regard to their numbers.

2.7 Figures

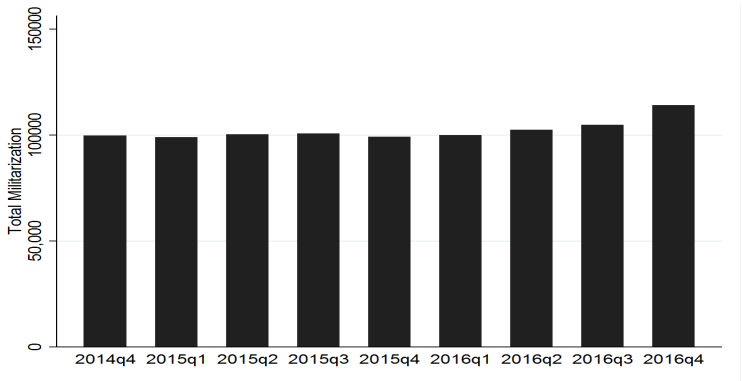

Figure 2.1 Total value of military hardware received by law enforcement agencies (in 10,000 2016 dollars)

Chapter 3

Racial Threat and Critical Mass: A Curvilinear Effect of Race on Police Militarization

3.1 Introduction

In August of 2014, the shooting death of 18 year old Michael Brown (CBS News, 2014) by an officer of the Ferguson, MO, Police Department ignited a heated debate over police militarization and accusations of racial bias against police across the country. Soon after the Brown shooting, police confronted protesters with armored vehicles, body armor, grenade launchers, and other equipment presenting the image of an occupying army subduing an unruly population rather than an agency delivering a public service (Rahall 2015). Activists argued that this was evidence of an on-going trend of militarization, while law enforcement officials defended police conduct as necessary for such a dangerous and unpredictable profession. The debate quickly focused on race: common assertions are that police militarization, and police activities in general, are a way to repress racial minorities, particularly Blacks, with many believing that the modern criminal justice system is an extension of past repression (Alexander 2012; Pew Research Center 2016).

The use of police to enforce racial divisions is not a new phenomenon in the United States (Smith and Alpert 2007), with observations of such behavior going back at least as far as Du Bois (1899), and considerable modern research exists that demonstrates an apparent asymmetry in the way police treat Whites versus other racial groups (Baumgartner, Epp, and Shoub 2018; Edwards, Esposito, and Lee 2018; Eitle, D'Alessio, and Stolzenberg 2002; Gelman, Fagan, and Kiss 2007; Petrocelli, Piquero, and Smith 2003; Wilkins and Williams

2008), but studies of such activity neglect the phenomenon of police militarization likely due to the difficulty in both defining and quantifying the concept and the relatively recent salience of the phenomenon. In addition, the quantitative study of police militarization primarily focuses on its effects rather than its causes[1] (Bove and Gavrilova 2017; Delehanty et al. 2017; Lawson 2019).

In this paper, I argue that police are a bureaucratic agent of the state that exists to maintain order, a function which includes the activities typically associated with policing such as enforcing laws and capturing violators (Wilson 1978). In the highly racialized society of the United States, maintaining order involves protecting boundaries within the racial hierarchy established by state institutions that provide differential treatment to citizens to create and reinforce those boundaries (Pettit and Western 2004; Soss, Fording, and Schram 2011). Police, as a part of the repressive, punitive, and exclusionary "face" of the state (Soss and Weaver 2017), protect the hegemonic position of Whites in the American racial hierarchy and respond to perceived threats against that position (Epp, Maynard-Moody, and Haider-Markel 2014). In other words, as police perceive a greater threat to order, they become more militarized in response. I further argue that race is an important factor in how much threat police perceive. Over time, with the rise of "law and order" politics and "Broken Windows" policing practices, police begin to see themselves as soldiers on the front line of an on-going war against an enemy–minority racial groups, which they associate with a greater tendency towards criminality and, thus, greater danger–that outnumbers them, fighting to maintain the existing social order against threats to its stability (Meeks 2006). They begin to see the use of force, including lethal force, as a more acceptable means to achieve their goals–the most important of which is to go home at the end of a day spent facing the ever-present threat of death (Stoughton 2014). Along with a militaristic mentality comes the desire to be equipped like a military force: the greater the threat, the greater the need for more and

[1] For one notable exception, however, see (Coyne and Hall 2018)

better equipment to confront that threat. I further argue that racial demographics may have a non-linear effect on police militarization; the association between racial minority proportion(s) and militarization should be positive until the minority proportion(s) become large enough to allow for minority groups to affect police department behavior in some way[2], at which point the association should become negative.

Following Delehanty et al. (2017) and Lawson (2019), I operationalize militarization using records of surplus military equipment received by police departments through the 1033 program from 2014 through 2016, which I obtained via Freedom of Information Act request. Similar to much of the existing literature that examines racial threat (Blalock 1967; Giles and Hertz 1994; Stults and Baumer 2007; Welch and Payne 2010), I measure threat as the non-White proportion of populations, and as the proportion that is Black, Latino/a, and Asian using estimates at either the county (for agencies with county-wide jurisdiction, such as a sheriffs' office) or census place (for municipal agencies, such as town or city police departments) level from the American Community Survey. Controlling for several other possible causes of militarization, I find support for the nonlinear hypotheses. The association between militarization and the non-White, Black, and Latino/a proportions of local populations, respectively, is positive and significant until reaching a peak–at around 50% non-White or Latino/a and around 36% Black, respectively–at which point the association becomes negative. I also discuss several potential mechanisms through which larger minority proportions could alter police behavior.

Though currently available data do not exist for a proper causal inference study, and the findings here should be interpreted as supporting an association rather than a causal relationship, these findings represent a potentially important contribution to the study of race and law enforcement. While a considerable literature about differential police treatment of

[2]Though examining the specific mechanism through which exceeding this "tipping point" proportion should alter police behavior, I provide a discussion of possible mechanisms in the section that follows the results of the main analyses.

Whites and minorities exists, and there is an on-going public debate about whether and to what extent police use violence against minority civilians, this paper provides a theoretical argument that links all of this research together. Police militarize, and exert harsher treatment against, racial minorities based on the perceived threat of those minority populations. Greater threat, represented by the size of minority populations, leads to more militarization until the minority population becomes large enough to influence police behavior through one of several possible mechanisms. Recent research finds an association between militarization and the frequency of civilian deaths (Delehanty et al. 2017; Lawson 2019), and because police are more militarized in areas with larger minority populations, as long as the population is not at or above the "tipping point," that results in more Black and Latino/a civilian deaths than White.

In the sections that follow, I expand my theoretical argument and present four hypotheses. Next, I describe the data and methods I use to test these hypotheses. Next, I describe and interpret the results. Finally, I offer some conclusions and implications.

3.2 Racial Hierarchy and the Role of Police

Societies tend to organize into hierarchies based on social groups. Hierarchies provide a framework for distributing scarce resources among members of a society that benefits the dominant group–that group controls resources, and members of the group receive a larger share. States formalize this framework using institutions that establish and reinforce group boundaries (Pettit and Western 2004; Sharkey 2013; Soss, Fording, and Schram 2011; Van Cleve 2016). While it is possible for state institutions to reinforce boundaries directly, by differentially distributing resources to different groups, they can also do so by providing different experiences to members of different groups. In particular, street-level bureaucrats, government workers that engage directly with the public and operate with significant discretion (Lipsky 1980), can have a large impact on an individual's perceived position within the societal hierarchy, suggesting that the person is part of the dominant group (and, therefore,

receiving preferential or simply kind treatment) or a subordinate group (by receiving harsh, dismissive, or discriminatory treatment (Sidanius and Pratto 1999)) (Michener 2017).

There is a broad consensus, among both scholars and the general public, that a racial hierarchy exists in the United States with Whites in the dominant position (Song 2006) and that the processes that generate the different hierarchy-enforcing experiences of different groups are racialized (Kohler-Hausmann 2010; Pettit and Western 2004; Reed 2002; Soss, Fording, and Schram 2008). This relationship among racial groups originated almost immediately as Europeans began to colonize North America (Brown 1999; Carmines and Stimson 1989; King and Smith 2005; Lowndes, Novkov, and Warren 2008; Quadagno 1994). Initially, Native Americans held the subordinate position in the hierarchy, but the institution of slavery in the North American colonies (and, later, in the United States) placed Blacks into that position. Anti-Black racism encouraged the maintenance of a hierarchical structure with Blacks at the bottom and Whites at the top, and even today the strong anti-Black orientation of White Americans is one reason that Blacks remain at the bottom of the racial hierarchy (Feagan 2000). While other racial groups do not share the same history of experiencing explicit, institutional, and violent oppression as Blacks, those other groups, such as Asians and Latinos, also occupy positions on the racial hierarchy below the dominant Whites (Song 2006).

Institutions can reinforce hierarchy in two ways, which Soss and Weaver (2017) refer to as the "two faces" of the state. The first "face" is the face of liberal democratic government; it is inclusive and brings the public together. Examples of this face are public schools and hospitals. These state institutions can reinforce hierarchical boundaries, but doing so is not their purpose. In those situations, it is easier to dismiss that result as an unintentional institutional failure. The second "face" is punitive and repressive: criminal courts, prisons, police, etc. These institutions are designed to exclude certain people from society. When they reinforce hierarchical boundaries, it is intentional (Michener 2017; Soss and Weaver 2017).

At first glance, it may seem controversial to assert that police reinforce hierarchies through their activities rather than simply, and neutrally, enforcing law and punishing violators. Normatively we may associate the police with, for example, the Los Angeles Police Department motto "To Protect and Serve[3]." However, understanding the function of police requires understanding the role of police. Police are street-level bureaucrats with significant discretion, including the legal authority to kill (Lipsky 1980; Wilson 1989), and are primarily tasked with the role of maintaining public order (Wilson 1978). Order exists when there is no disorder, which is behavior that threatens peace or that involves conflict among two or more people. Within a society that is strongly based on a racial hierarchy, like the US, maintaining order means maintaining the racial hierarchy. Protecting the peace and resolving disputes about behavior mean acting to preserve the status quo, such as criminalizing Black youth in certain neighborhoods engaging in behaviors that are legal elsewhere (Muniz 2014), which places Whites at the top of the hierarchy and other groups below.

In resolving disputes and enforcing order, police act with significant discretion, allowing them to reinforce the existing hierarchy via treatment of individual members of racial groups. Thus, police are an institution that contributes to the creation and reinforcement of the racial hierarchy in the US (Muniz 2014; Weitzer 2014). The way police treat individuals can have this effect in one, or both, of two ways (Michener 2017). First, police can signal to a person that they are a part of a subordinate group by interacting with them in particular ways. By using aggressive questioning, threats, physical force, or any other action that signals suspicion police can communicate to a person that they do not belong where they are, and their membership of a subordinate group automatically makes them suspect. Second, police can permanently place someone into a position of hardship by arresting them, introducing them into a criminal system that potentially leaves a permanent record or ties them up in time-consuming and financially-draining court proceedings (Alexander 2012).

[3]http://www.lapdonline.org/history_of_the_lapd/content_basic_view/1128

Criminal records, or even temporary jail stays, could have enormous consequences on a person's economic stability and self-confidence, while communicating that the person is a member of a subordinate group. In the next section, I discuss the mechanism that motivates police to behave in this way, and what affect the severity of treatment.

3.3 Racial Threat and Police Militarization

As an institution tasked with maintaining order, police must confront any phenomenon that threatens order. Within a racialized society, any threats to the dominant racial group is also a threat to order. Threats to the dominant group involve competition between racial groups over various resources and can be economic threats, where a minority group challenges the dominant group for jobs and wages, political threats, where a minority group presents a potential challenge to the dominant group's political power and control over state institutions, or symbolic threats, where the dominant group sees a minority group as being more inclined toward criminal or other deviant behavior (Blalock 1967). The relationship between racial groups, then, is a function of their relative position with regard to politics, the economy, and social life (Giles and Hertz 1994). Racial attitudes are the product of collective beliefs about group position in the hierarchy (Blumer 1958) and the dominant group's fears of losing privileges or valuable resources (Weitzer and Tuch 2005). As threat to the dominant group increases, members of the dominant group will become more hostile to the threatening minority group. Hostility leads to demand for more state-sanctioned social control policies to preserve the dominant group's position (Blalock 1967; Dollar 2014). Importantly, it is the *perceived* threat that determines hostility, not necessarily real threat (Bobo and Hutchings 1996; Kinder and Sanders 1996).

Whites in the US are the dominant group in the racial hierarchy, and while the methods of protecting White hegemony vary throughout history, they share a common attribute: the use of public means of social control (D'Alessio, Eitle, and Stolzenberg 2005). Historically social control consisted of extra-judicial killings in response to greater perceive threat

to dissuade Black people from participating in the political process (Epperly et al. forthcoming). Later, social control transitioned away from open violence and into mechanisms of the state. Increased perceived threat increases both White voter turnout and the proportion of the White vote supporting conservative political candidates (Glaser 1994; Key 1949). In Louisiana, there was an association between greater threat and White support for David Duke, a prominent Ku Klux Klan leader, and in shifts in White political affiliation from the Democratic Party to the Republican Party (Giles and Buckner 1993; Giles and Hertz 1994). In Chicago, reconstruction of public housing, which forced the move of thousands of Black families to new homes and increased the perceived threat to White hegemony in neighborhoods to which they moved, led to an increase in White voter turnout in the new neighborhoods and a decrease in both turnout and the White conservative proportion of votes in the old (Enos 2016). In California, White support for Proposition 209, an effort to end affirmative action in the state, was higher in areas characterized by greater minority threat (Tolbert and Grummel 2003). Similarly, but more broadly, hostile political reactions appear to be more likely after a sudden increase in perceived threat (Hopkins 2010). The effects of racial threat also seem to go beyond the political process: schools are more likely to use punitive discipline and implement zero-tolerance policies as the proportion of the Black student population increases Welch and Payne 2010. In sum, despite some contradictory evidence (Leighley and Vedlitz 1999; Voss 1996), the evidence in support of racial threat appears quite strong in a variety of research areas.

There is some scholarly disagreement about the effects of racial threat on police behavior (Holmes et al. 2008; Stolzenberg, D'Alessio, and Eitle 2004), but the police are an obvious institutional mechanism for social control, as social control is their primary purpose, and they have the unique power to legally take away a person's rights–up to and including the right to life. Police are the primary state agent of coercion, and their activities are necessary to maintaining the societal status quo (Jacobs and Helms 1997). Police also operate with significant institutional discretion in addition to the discretion of individual

street-level officers, as oversight of police departments is typically quite limited (Herbert 2001; Prenzler and Ronken 2001). It is plausible, then, that in carrying out the role of maintaining order police also protect the privileges and power of Whites (Correll et al. 2007). And, since police exercise discretion at all levels of an agency (Kelling 1999), police departments enforce the racial hierarchy by their treatment of racial groups just as individual officers do so by their treatment of individuals. As a result, Whites tend to see the police as allies (Weitzer and Tuch 2005) and to see Blacks as more inclined toward criminal behavior (Hurwitz and Peffley 1997). Minorities, specifically Blacks and Hispanics, are more likely to see police as an abusive, visible sign of white hegemony (Bayley and Mendelsohn 1969). Police officers are more likely to use force–and greater amounts of force–on minority suspects, and black suspects are about five times more likely to be killed by police (Alpert and Dunham 2004; Correll et al. 2007). Police are more likely to initiate a traffic stop on Black and Latino drivers in North Carolina (Baumgartner, Epp, and Shoub 2018) and to stop and search Black and Latino pedestrians under New York City's now-infamous "stop and frisk" policy (Gelman, Fagan, and Kiss 2007). There is also an association between perceived Black threat and the arrest rates of Black people on drug charges (Eitle and Monahan 2009), and an apparent relationship between Black or Latino/a threat and the number of complaints about police brutality (Smith and Holmes 2006). Lastly, carceral institutions show a systematic bias against minority racial groups, controlling for poverty and crime (Travis, Western, and Redburn 2014).

It is plausible that militarization is another mechanism through which police engage in social control to maintain order. Though militarization has received sporadic attention (Balko 2013; Bove and Gavrilova 2017; Delehanty et al. 2017; Lawson 2019), particularly from scholars of criminology (Kraska and Cubellis 1997; Kraska and Kappeler 1997; Kraska 1999; Kraska 2007; Meeks 2006), there is little to no research examining why po-

lice militarize[4] and no apparent consensus on what militarization means. For the purposes of this paper, I define militarization as the implementation of a militaristic ideology, which involves the adoption of beliefs and values that emphasize the use of force as an acceptable, or desirable, way to solve problems (Kraska 2007). Essentially, this process involves police officers increasingly seeing themselves as soldiers fighting a war among an occupied and hostile enemy population.

The process of militarization may have begun in the 1960s with the rise of "law and order" politics. The public, and candidates for political office, began to demand tough new policies and more resources for law enforcement to confront the growing problem of street crime–which was, at least in part, a stand-in for general fear of a rapidly changing society. Despite the leveling-off and eventual reduction of crime–for which these new policies and reasons should receive only little to no credit (Scheingold 1984)—demands for ever-tougher crime policies continued. The law and order movement contained a noticeable racial dimension, with high-profile politicians such as Barry Goldwater connecting civil disobedience and protest with street violence and Black political activists with criminals. In effect, "law and order" politics was, at least in part, a reaction to a perceived growing threat against White hegemony (Murakawa 2008), and the resulting increase in resources for law enforcement agencies provided greater means with which to exercise control on minority groups (Soss and Weaver 2017).

Not long after the rise of "law and order" politics, "Broken Windows" theory called for police to flood communities with officers and harshly punish any infraction, no matter how minor, based on the logic that small infractions, if left unchecked, signaled disorder and would encourage more severe crime in the future (Wilson and Kelling 1982). This theory of policing placed the blame for crime on communities themselves, rather than structural "root causes" as in the past (Soss and Weaver 2017), further connecting minority communities

[4]For one notable example, see Coyne and Hall (2018)

with crime and justifying police behavior that resembled an occupying army subjugating an enemy population. Combined, "Broken Windows" and "law and order" politics increasingly framed minority groups as an enemy to the dominant Whites, which leads to greater animosity and desire for retaliation as the perceived threat from minority groups increases (Huddy et al. 2005). "Broken Windows" provided a theoretical reason for police to militarize against minority communities. "Law and Order" politics provided the resources—financial, manpower, and political will–to carry out such mobilization. The significant discretion of police departments and officers, operating essentially as autonomous agencies separated from most political control (Deflem 2000), facilitated both: police could choose which communities to flood with officers, which minor offenses to punish, how severely to punish them, and, in general, how to use their resources to better maintain order. Police react to the perceived threat against public order by militarizing, seeing themselves as soldiers protecting public order from a dangerous and threatening opponent. Greater threat means police become more militarized to properly confront that threat.

Properly capturing the concept of "perceived threat" represents a potential difficulty, but a vast literature on racial threat provides a plausible operationalization: population. Studies of racial threat effects, including those cited previously, use either the size or the proportion of minority racial groups within a population to measure the perceived threat against Whites (Dollar 2014). As the minority population increases, the potential economic, political, or symbolic threat against White hegemony also increases. And, because White hegemony represents order, police respond to the threat to order by militarizing more.

3.4 Critical Mass: a Non-Linear Effect of Racial Threat?

What about localities where the White population is not clearly dominant? Minority group populations could grow to the point that those groups can affect police behavior through several potential mechanisms. One possible avenue is through descriptive representation, either by influencing elected officials as an influential voting block or by electing

their own group members to office (Bobo and Gilliam 1990; Spence and McClerking 2010). Larger minority populations may allow for political mobilization of minority groups to protect their interests (Horowitz 1985). In addition, elites of the dominant group may prefer accommodation of powerful minority groups to antagonizing them (Turk 1969). Such political influence could translate to benefits for minority communities, as elected officials from those communities empower fellow group members or White elected officials avoid alienating a large voting bloc (Eisinger 1982; Horowitz 1985; Mladenka 1989).

Another possible avenue is representative bureaucracy, which involves minority groups members influencing police behavior because members of those groups are, themselves, police officers (Fyfe 1980; Meier 1975; Meier, Wrinkle, and Polinard 1999). There is evidence of representation leading to beneficial outcomes for minority groups (Brudney, Hebert, and Wright 2000), such as and of representation of gender and race leading to more positive evaluations of police performance (Riccucci, Van Ryzin, and Lavena 2014; Riccucci, Van Ryzin, and Jackson 2018; Theobald and Haider-Markel 2009), a reduction of complaints by members of represented groups (Hong 2017b), and a reduction of racial profiling practices (Hong 2017a). However, findings are mixed with regard to whether minority police officers affect behavior in a way that benefits their communities (Bradbury and Kellough 2011; Holmes et al. 2008; Nicholson-Crotty, Nicholson-Crotty, and Fernandez 2017; Sharp 2014; Wilkins and Williams 2008).

The minority group proportion may have to exceed a critical mass–a point at which the group proportion is large enough to affect the flow of benefits to the group–before any benefits occur (Meier 1993). At smaller proportions, members of minority groups may be afraid to act in a way that benefits their fellow group members and contradicts the usual operation of an organization, but as proportions grow larger those members feel more secure in advocating for their groups (Kanter 1977). Within bureaucratic organizations, behavior is similar: representation of a minority group requires a proportion that meets or exceeds this critical mass before employees feel empowered enough to affect the provision of benefits

to their groups (Henderson 1979). Within a police force, this critical mass likely becomes even more important. Even though street-level bureaucrats such as police officers are more likely to engage in active representation (Meier 1993; Thompson 1976), reaching a critical mass large enough to overcome the inherently close-knit culture (Breci 1997; Armacost 2003; Mastrofski 2004) and intense socialization process (Oberfield 2011) that typically characterize police departments.

The third possibility is the contact hypothesis, which argues that higher proportions of minorities in a population may simple encourage contact between Whites and minority groups, leading to greater familiarity and less hostility (Aberbach and Walker 1973; Allport 1954; Oliver 2010; Pettigrew 1986; Sigelman and Welch 1993). A considerable literature exists documenting evidence supporting the contact hypothesis, such as differences in Whites' opinion of Blacks in segregated vs. desegregated public housing (Deutsch and Collins 1951) and neighborhoods (Meer and Freedman 1966). Inter-race interaction in school settings also contributes to friendlier relations between racial groups (Patchen 1982). In general, social interaction between members of different racial groups can promote cooperation between those groups and reduce hostility (Yancey 1999), which could also reduce the threat perceived by police if minority groups are large enough to facilitate more frequent contact.

The effect of racial group proportions on police militarization, then, would reverse upon achieving critical mass. Blalock (1967) theorized that the relationship between threat and social control should be nonlinear, and there is evidence of such a relationship. Epperly et al. (forthcoming) find a non-linear relationship between the Black population and the probability of a lynching during the late 19th and early 20th century. While having a Black mayor does not seem to affect Black arrest rates, arrest rates decline when the Black population rises to around 40% (Eitle and Monahan 2009). The effect of the non-White population, generally, on resources devoted to crime control follows a similar pattern (Greenberg, Kessler, and Loftin 1985). Other research finds nonlinear relationships in studies of police

resources (Jackson 1986; Kane 2003), police expenditures (Jackson and Carroll 1981), and police force size (Stults and Baumer 2007).

Militarization may follow the same pattern. If police react to minority threat by militarizing as the threat to White dominance increases, then militarization should increase as the minority proportion(s) of a population increases until the proportion reaches the critical mass level. Above that point, Whites no longer have sole control of public institutions in the locality, and other groups may influence those institutions to benefit themselves. In such a case, police militarization should decrease as the minority proportion(s) decreases. This leads to the following additional hypotheses:

General Threat Nonlinear Hypothesis: As the proportion of a population that is non-White increase, the police department serving that population should become more militarized until the proportion reaches the "tipping point" at which the relationship becomes negative.

Specific Threat Nonlinear Hypothesis: As the proportion of an individual racial group increases, the police department serving that population should become more militarized until the proportion reaches the "tipping point" at which the relationship becomes negative.

3.5 Data and Methods

3.5.1 Militarization

Militarization is a difficult concept to measure because it involves the psychology of police officers. However, scholars continue to try to measure the concept. For example, in an earlier work, (Kraska and Kappeler 1997; Balko 2013) measure militarization as the number of police paramilitary units (PPUs, also known as Special Weapons and Tactics or SWAT teams) in the United States. Measures such as this are typically dichotomous variable indicating whether a particular police department has such a unit. While this may be an effective measure for some purposes, it lacks variation that could convey *how* militarized a police department is.

One potential avenue for measuring the level of militarization in a police department is to use the amount of military equipment an agency receives as a proxy for its militarization (Delehanty et al. 2017; Lawson 2019). The creation and expansion of programs such as the 1208 program and its successor, the more well-known 1033 program, facilitated such a measure because they created relatively easy processes that law enforcement agencies could use to obtain military equipment from the Department of Defense. In 1990, the National Defense Authorization Act created the 1208 program to allow federal, state, and local law enforcement agencies to request and obtain surplus military equipment through the Department of Defense to assist in anti-drug operations. In 1997, Congress changed this program's name to 1033 and expanded its scope to include counter-terrorism ("1033 Program FAQs" n.d.). Similarly, the dependent variable for this paper is the dollar value of military equipment in each police department's possession from 2014 through 2016. As the 1033 data are quarterly, I take the average amount of all four quarters each for 2015 and 2016. For 2014 I use only the fourth quarter, because that is the only quarter available in the 1033 program data.

Some argue that this program contributes to militarization by allowing materials built for war to fall into the hands of domestic, civilian law enforcement (Rahall 2015). Moreover, the sharing of equipment may also lead to a sharing of tactics and psychology, leading to a more militaristic mindset among police officer (Meeks 2006). There is also evidence of an association between militarization, measured as equipment obtained through the 1033 program, and the frequency of civilian deaths by police (Delehanty et al. 2017; Lawson 2019). It seems logical, then, to assume a connection between more psychological militarization and a greater desire to obtain military weapons and equipment. In addition, the larger, more visible, and more expensive the equipment, the more militarization it likely represents. Thus, I operationalize militarization as the dollar value of controlled military equipment an agency has in each quarter through the 1033 program. I obtained this data through a Freedom of Information Act request to the Defense Logistics Agency, which

administers the 1033 program. To obtain equipment through the 1033 program, law enforcement agencies with at least one sworn officer need only to browse an online database or visit a storage warehouse and request the desired equipment. The agency pays the cost of transport, but the equipment is free of charge. (Molina 2014). The Defense Logistics Agency maintains a quarterly inventory of all controlled equipment in a law enforcement agency's possession. However, before the fourth quarter of 2014, when DLA began to release these inventories publicly, they did not maintain records of old inventory spreadsheets. This means that the fourth quarter of 2014 is the earliest available record of 1033 equipment by agency. In addition, only controlled equipment (such as weapons and vehicle) remain in the inventory indefinitely. Non-controlled equipment (such as clothing) appears on the inventory when it transfers, but after one year that equipment becomes the property of the receiving agency and comes off the inventory. It is impossible to distinguish when equipment drops off the inventory due to reaching the one year mark, and thus remains agency property, from when the agency returns the equipment to the Defense Logistics Agency. II include only controlled equipment, as it remains on the inventory as long as it is in the possession of the receiving agency.

There is evidence that the 1033 program leads to public benefits such as crime reduction (Bove and Gavrilova 2017). However, there is also evidence that police departments that acquire more 1033 program equipment kill more civilians (Delehanty et al. 2017; Lawson 2019) and, to date, there is no apparent evidence to determine what causes some police departments to acquire more equipment than others. If the process that leads police to acquire more military equipment is also increasing the number of civilian deaths, it is necessary to determine what factors influence that process to obtain a clearer understanding of the phenomenon of militarization.

3.5.2 Independent Variables

The independent variables measure the proportion of the population under each police department's jurisdiction from 2014-2016 that belongs to four racial categories: White, Black, Latino/a, and Asian. The size or proportion of one or more racial minority populations is a common measurement of racial threat (Blalock 1967; Dollar 2014) and increasing the size of a minority population can improve political participation (Spence and McClerking 2010) and power (Eisinger 1982). In addition, population demographics are likely not a result of self-selection of residents into cities with more militarization, especially given the relatively recent public awareness of the phenomenon. These measures capture racial threat in two ways. First, the non-White proportion of a population captures the extent to which an increase in the non-White population in general affects police militarization (Greenberg, Kessler, and Loftin 1985). I expect a positive association between percent non-White and militarization: as the non-White proportion of a population increases militarization should increase. Second, the Black, Latino/a, and Asian proportions capture any racial threat effects that are specific to racial groups (Kane 2003; Eitle and Monahan 2009; Enos 2016; Giles and Hertz 1994; Glaser 1994; Stults and Baumer 2007). For racial threat effects to apply to either group, I expect a positive association between that racial category and militarization. I obtained these data from American Community Survey estimates for 2014, 2015, and 2016, which are based on US Census data. For the White, Black, and Asian categories, I use only the proportion of the population that is that category and also "not Hispanic" to avoid overlap with the Hispanic category. To determine whether, and to what extent, the effect of race on militarization is non-linear, I include a squared term of each racial group similar to other research that examines racial threat effects (Eitle and Monahan 2009; Greenberg, Kessler, and Loftin 1985; Jackson and Carroll 1981; Jackson 1986; Jackson 1989; Kane 2003; Stults and Baumer 2007).

3.5.3 Control Variables

While a connection between racial demographics and police militarization seems plausible, there are a range of other potential explanations for why police departments use the 1033 program. The following are the control variables I include in each model to adequately isolate the effects of the racial variables. For agencies with sub-county jurisdiction, control variables (where appropriate) are at the US Census Place level. Controls for county-wide agencies are at the county level.

Population. Police departments may become more militarized as a result of serving communities with high populations. In these areas, the per capita number of police officers is likely to be lower than in areas with low populations, even if the raw number of officers is higher. The sense of being outnumbered may lead to a stronger perception of danger for police departments, who respond by obtaining surplus military equipment for added protection and strength. To account for population, I use the American Community Survey's estimates of total population, divided by 10,000, by county for sheriff's offices and county police departments, and by census place for police agencies with sub-county jurisdiction.

Regional Variation. It is possible that variations in regional attributes other than racial demographics contribute to militarization. In particular, people in the South are more conservative and possibly more punitive than those in other regions (Baumer, Messner, and Rosenfeld 2003). To account for differences related to South versus non-South regional distinctions, I include a binary variable where 1 indicates a state that declared secession from the US during the American Civil War, 0 otherwise.

Political Climate. Similarly, the prevailing political ideology of a locality may influence police behavior. Cities and counties with more conservative populations should also be more punitive and authoritarian, supporting the increased militarization of police to maintain public order (Baumer, Messner, and Rosenfeld 2003). I use city and county preference estimates from (Tausanovitch and Warshaw 2013) to measure local political ideologies. Specifically, a higher value means the population is more conservative.

Financial Flexibility. While the 1033 program provides surplus military equipment to law enforcement at no charge (police pay only the cost of transport), it is possible that police department with more robust financial resources will simply purchase equipment themselves instead of using the 1033 program. However, using a police department's total operating budget correlates strongly with population, resulting in a possible collinearity problem. The total operating budget also does not necessarily account for budget flexibility or the availability of surplus funds, as larger police departments will almost certainly have higher budgets than smaller departments. Instead, I calculate the operating budget per full-time, sworn office within each agency. This value seems to more adequately capture the concept of budget flexibility that would allow departments to purchase their own equipment separately from the 1033 program. I also divide this variable by 10,000 to keep coefficients manageable.

Poverty. Police militarization may be a mechanism of social control of the poor instead of, or in addition to, racial minorities (Dolan and Carr 2015). Higher levels of poverty can mean a greater potential threat to officer safety (Terrill and Reisig 2003). Police should then respond to this threat by obtaining more equipment through the 1033 program in order to better protect themselves and exert control over the population. As a measure of poverty, I use the percentage of the population within each department's jurisdiction that is below the poverty line in each year according to estimates from the American Community Survey.

Violent Crime. This is, perhaps, the most obvious alternative explanation. Assisting police in responding to crime is one of the primary purposes of the 1033 program, and violent crime is typically more heinous–and less subject to underreporting–than other types of crime. The frequency of violent crime should also directly affect whether and how much police departments militarize because more frequent violent crime presents a greater threat to officer safety. I include this as a control by calculating the number of violent crimes per 10,000 population in each year, using data from the FBI's Crime in the United States series.

County-wide Jurisdiction. Finally, I include a binary variable that indicates whether a

law enforcement agency has county-wide jurisdiction, such as a county police department or a county sheriff's office, from the 2013 LEMAS survey. These agencies are responsible for serving a much larger geographic area than their city or town counterparts. Having to cover a larger area with a potentially more diverse and spread out population could potentially mean the need for more equipment.

3.5.4 Model Specification

To test this theory, I compiled a dataset of both county-level and sub-county law enforcement agencies from 2014 through 2016. The final data contain 2,135 observations[5]. The dependent variable is heavily over-dispersed, right-skewed ($mean = 33.426$, $variance = 13,825.8$), and contains 814 zeros. To account for this, I use zero-inflated negative binomial regression to test my hypotheses[6]. Zero-inflated negative binomial regressions estimate two models. The first is the count model, which truncates excess zeros from the dependent variable and measures the effect of each independent variable on the expected value of the dependent variable. The second is the zero-inflation model, which captures the excess zeros and measures each variables effect on the probability that the dependent variable is one of these zeros. Essentially, this model treats zeros as if they can be generated by two separate processes. A police department may have zero dollars in 1033 equipment in two ways. First, a police department may not join the 1033 program. Second, a police department may join the 1033 program but never request equipment[7] In all models the zero-inflation portion is a probit model. The ln(Alpha) parameter, which mea-

[5] See Table 3.1 for summary statistics

[6] For alternative model specifications, see the appendix.

[7] It may seem counter-intuitive for a police department to join a program and then not participate, but the cost to join the 1033 program is minimal; the application consists of a half page of information about the department. For results of a hurdle model, which is similar to the ZINB but assumes only one zero-generation process, see the appendix.

sures over-dispersion in the dependent variable, is significant in each model. This suggests further support for the use of a negative binomial model.

The percent non-White measure correlates strongly with both the percent Black and the percent Latino/a measures (0.54 and 0.72, respectively). Such correlation raises the potential of a collinearity problem, so I estimate two models: one that includes only percent non-White and one that includes percent Black, percent Latino/a, and percent Asian. These models allow me to determine the general effect of non-White racial threat on militarization and the specific effects of the larges racial minority groups included in the American Community Survey.

3.6 Results

Table 3.2 depicts the results of the General Threat model. This includes the non-White population proportion as the primary independent variable. The results for this model seem to support the non-linear hypothesis. There is a positive and significant ($p < 0.001$) association between percent non-White and militarization, but the the squared term is negative and significant ($p < 0.001$), suggesting a curvilinear relationship. In the zero-inflation model, the non-White population has a positive and significant ($p < 0.001$) effect on the probability of a police department being an excess or certain zero in militarization, and the squared term is negative and significant ($p < 0.001$).

Though results tables can provide an interpretation of the direction and significance of an association, the difficulty of interpreting coefficients–particularly when quadratic terms are involved–means it is necessary to calculate and graph predicted values of the dependent variable. Figure 3.1 depicts predicted militarization at non-White proportions from zero to 100, with 95% confidence intervals in gray[8] As the table suggested, the association is initially positive; militarization increases from 0% non-White up to around 50%, then be-

[8]All graphs made using Stata's plottig package (Bischof 2017).

comes negative. At 100% non-White the level of militarization is essentially the same as at 0%. The peak militarization value is slightly more than 45, or $450,000 in equipment, at a non-White proportion of 53%.

The results for the control variables are largely as expected. The variables for South, poverty, and political ideology all fail to achieve significant. The coefficients for population, violent crime, budget flexibility, and county-wide jurisdiction are positive and significant ($p < 0.05, p < 0.05, p < 0.01, p < 0.01$, respectively). Police are more militarized when their populations are higher, they have county-wide jurisdiction, there is high violent crime in their jurisdiction, or they have more budget dollars per full-time officer. The latter is the only result that is counter-intuitive: I expected a negative association between budget flexibility and militarization. Further investigation into the relationship between department finances and militarization may yield interesting findings.

Table 3.3 contains the results of the Specific Threat model, which separates non-White populations into three specific groups–Black, Latino/a, and Asian–to determine which individual racial groups affect militarization. These results also support the non-linear hypothesis. Percent Black and Percent Latino/a are both positive and significantly ($p < 0.01, p < 0.001$, respectively) associated with militarization, but the squared terms of each are negative and significant ($p < 0.01, p < 0.001$, respectively). Again, this suggests that militarization increases as these proportions increase until reaching a certain tipping point where the effect becomes negative. Neither Percent Asian nor its squared term are significant, likely due to the relatively higher position of Asians in the racial hierarchy (Dixon 2006).

Figure 3.2 and Figure 3.3 depict the predicted militarization of police departments with populations ranging from 0-100% of the Black and Latino/a racial groups. In each graph, the two racial groups not shown are set to zero. The association between the Black and Latino/a proportions and militarization is initially positive, but turns negative and, again, militarization reaches roughly the same level at 100% as at 0%. For the Black propor-

tion, militarization peaks at 21.37, or $213,700 in military equipment, at a proportion of 36%. For the Latino/a proportion, the peak is 42.91, or $429,100, at 50% Latino/a. For the Asian proportion, the pattern is similar–initially positive before turning negative at a tipping point–but with insignificant coefficients the effect of the Asian population cannot be differentiated from zero.

In Table 3.3, the results for violent crime, budget flexibility, and county-wide jurisdiction are similar as in Table 3.2: both are positive and significantly ($p < 0.01, p < 0.05, p < 0.01$, respectively) associated with militarization. Population becomes insignificant, as are the rest of the control variables. Police departments with jurisdictions characterized by higher violent crime or county-wide jurisdiction, or with more budget dollars per full-time officers, are more militarized.

3.7 Specific Tipping Point Mechanism

There are several potential mechanisms, discussed previously, through which the positive relationship between racial demographics and militarization may reverse once the population proportion reaches a certain level. Unfortunately, performing the tests necessary for determining which mechanism(s) is(are) driving this curvilinear relationship requires data that are not currently available. However, to perform some preliminary tests that may suggest the causal mechanism, I collected data on the racial demographics of city councils in the US in 2011[9] and combined it with data on police department demographics from the 2013 Law Enforcement Management and Administrative Statistics survey, and militarization and population racial demographics from 2014. In addition, I create dummy variables indicating the city's region of the country[10]. Due to the large decrease in the number of us-

[9]International City/County Management Association provided by Jessica Trounstine.

[10]Regions are from https://icma.org/icma-regions-us, with the exception of Texas, which I code as South rather than West.

able observations, I ran models with only the non-White proportion of city councils, police departments, and populations. Only data on cities are publicly available from ICMA, so observations are city police departments only. Standard errors are clustered by county in all models that follow.

Table 3.4 depicts the results of several sequential models intended to determine the specific mechanism through which greater proportions of non-White populations would eventually reverse militarization. Model 3 is a negative binomial regression[11] of the percent of city councils that are non-White on the non-White proportion of a city's population and the control variables discussed in the preceding paragraph. Unsurprisingly, there is a positive and significant ($p < 0.001$) relationship between the two. As populations become more non-White, they elect larger proportions of non-White representatives to city councils.

The next step is to determine the association between non-White populations and non-White council representation on the non-White proportion of police officers. Model 4 depicts the results of a Poisson regression model[12] testing this relationship. Both the non-White proportions of the city council and the population have a positive and significant ($p < 0.05$, $p < 0.001$, respectively) association with the non-White proportion of police officers within a department. This suggests that the non-White proportion of a population may influence non-White representation in the police, both through the influence of non-White council representation and directly.

Next, I examine the effect of all three proportions on militarization. Model 5 depicts the results of a negative binomial regression of militarization on all three race variables, including squared terms to account for curvilinear relationships, and the poverty and regional controls. In this model, both the non-White proportions of police and populations

[11] The significance of the alpha parameter and over-dispersion of the dependent variable suggest a negative binomial model is most appropriate.

[12] Again, the dependent variable is overly dispersed, but the alpha parameter is not significant in a negative binomial model.

have a curvilinear association with militarization. Each race term is positive and significant ($p < 0.01, p < 0.01$, respectively) while the squared terms are negative and significant ($p < 0.05, p < 0.001$, respectively). The non-White proportion of city councils is not significant, nor is the squared term. This seems to suggest some preliminary support for representative bureaucracy and non-White populations acting as an influential political bloc, though not necessarily through electing their own members to public office.

3.8 Conclusion

This paper presents a theoretical explanation of police militarization as a result of the racial composition of a police department's jurisdiction. Much of the existing literature finds evidence that police behave differently toward different racial groups, but to date there is no attempt to study how race affects the militarization of police in the United States. I argue that police militarization is, at least in part, a response to perceived threat of minority racial groups to White hegemony. This racial threat causes anxiety and hostility among Whites, who use mechanisms of the state–such as the police–to maintain their political, economic, and social position. The less White a population becomes, the more threatened Whites feel. The police respond to this hostility and anxiety by militarizing, in an effort to both protect White interests and to better subjugate non-White populations, until those populations become large enough to influence police behavior.

The results of two zero-inflated negative binomial regressions suggest support for this theory: I find a curvilinear association between militarization and the non-White proportion of populations generally, and between militarization and the Black and Latino/a proportion specifically, controlling for several other plausible explanations. The association is positive until reaching a certain tipping point proportion of the population. Then the association becomes negative. The ability of minority groups to affect police behavior could plausibly take one, or more, of several forms. Larger minority populations could obtain potential political power as those populations represent a large bloc of votes (Eisinger 1982); political

officials that allow police departments to continue behaviors seen by minority communities as repressive run a large risk of losing their positions in future elections. Or they could increase their representation within police departments (Nicholson-Crotty, Nicholson-Crotty, and Fernandez 2017). They could use their group size to elect members of the group to public office (Bobo and Gilliam 1990; Spence and McClerking 2010). Testing the specific mechanisms through which minority groups affect police behavior to their benefit is difficult due to the current lack of useful data for such a purpose, but future work may be able to examine this question more effectively.

It is important to note that, while this paper presents a plausible causal relationship between race and militarization theoretically, the analyses can only be interpreted as finding an association empirically. Establishing a causal relationship would likely require a panel dataset that covers a larger time period. Unfortunately, these data do not exist at this time. Future research may be able to take advantage of new data that will allow for stronger causal inference.

Still, the findings in this paper speak to several popular observations and ideas of policing. Many have made the claim that police are more likely to kill racial minorities—particularly Blacks and Latino/as–than Whites, and recent research suggests this claim is true (Edwards, Esposito, and Lee 2018). But to date, there has been no theoretical explanation as to why. This paper provides a potential answer to that question. By combining the findings of (Edwards, Esposito, and Lee 2018) and (Lawson 2019) with an argument that connects militarization to race, the obvious conclusion seems to be that police become more militarized in areas where there are more Black or Hispanic people so long as those minority groups do not reach their tipping point level, and police that are more militarized kill more people. In other words, police are most militarized when the population has a large proportion of Black or Latino/a residents, but not so large as to provide those groups with the political influence necessary to reduce militarization. Thus, police kill more Black and Latino/a people, all else equal. This seems to be an important conclusion that offers

plausible empirical evidence of a claim that is commonly made in popular media but, so far, unexplored. Future research should work to further establish (or refute) this connection and clarify its mechanisms. Determining what causes militarization and its effects–both positive and negative–should be an important goal both for scholars and policymakers.

3.9 Tables

Table 3.1 Chapter 3 Summary Statistics

Variable	Min	Mean	Max	Std. Deviation
Militarization (divided by 10,000)	0	33.426	2268.156	117.583
Percent Non-White	0.200	30.599	99.200	21.781
Percent Black	0	10.793	82.100	13.942
Percent Latino/a	0	13.863	99.000	17.077
Percent Asian	0	2.913	58.400	5.016
South	0	0.421	1	0.494
Population (divided by 10,000)	0.081	22.295	1005.716	59.442
Percent Poverty	2.700	16.703	46.800	6.612
Violent Crimes per 10,000	0	19.038	195.791	25.604
Budget Per Officer (divided by 10,000)	2.803	15.836	78.899	9.191
Countywide	0	0.753	1	0.432
Ideology	-1.019	0.130	0.772	0.284

Total N = 2,135

Table 3.2 ZINB Regressions, General Threat model

	Count model	Zero-Inflation model
Percent Non-White	0.070(0.011)***	86.336(2.385)***
Percent Non-White^2	-0.001(0.000)***	-2.549(0.069)***
South	0.156(0.122)	-166.677(3.809)***
Population (divided by 10,000)	0.008(0.004)*	4.830(0.122)***
Percent Poverty	-0.009(0.013)	36.274(1.069)***
Violent Crime Rate	0.007(0.003)*	-19.059(0.508)***
Budget Per Officer (divided by 10,000)	0.027(0.010)**	-1.062(0.074)***
Countywide	0.664(0.193)**	-165.331(2.754)***
Ideology	0.309(0.319)	892.949(22.093)***
(Intercept)	0.771(0.369)***	-1476.252(42.879)***
ln(Alpha)	1.736(0.045)***	
N	2,135 (814 zeros)	
$***< 0.001$, $**< 0.01$, $*< 0.05$		
Wald $\chi^2(9)$ = 93.23	$Prob. > \chi^2$ = 0.000	
DV = Militarization (in $10,000s)		

Table 3.3 ZINB Regressions, Specific Threat model

	Count model	Zero-Inflation model
Percent Black	0.040(0.012)**	4.163(0.033)***
Percent Black^2	-0.001(0.000)**	0.012(0.001)***
Percent Latino/a	0.057(0.012)***	-23.933(0.172)***
Percent Latino/a^2	-0.001(0.000)***	0.350(0.003)***
Percent Asian	0.039(0.042)	103.272(0.719)***
Percent Asian^2	-0.002(0.001)	-1.536(0.013)***
South	0.147(0.119)	-167.572(1.201)***
Population (divided by 10,000)	0.008(0.005)	0.548(0.004)***
Percent Poverty	-0.011(0.014)	2.415(0.017)***
Violent Crime Rate	0.010(0.004)**	-78.762(0.562)***
Budget Per Officer (divided by 10,000)	0.022(0.011)*	-2.634(0.025)***
Countywide	0.775(0.239)**	454.703(12.006)***
Ideology	0.128(0.338)	1116.079(7.969)***
(Intercept)	1.155(0.379)**	-983.269(13.837)***
ln(Alpha)	1.731(0.046)***	
N	2,135 (814 zeros)	
$***< 0.001$, $**< 0.01$, $*< 0.05$		
Wald $\chi^2(13)$ = 108.20	$Prob. > \chi^2$ = 0.000	
DV = Militarization (in $10,000s)		

Table 3.4 Tests of Specific Threat Mechanisms

	Model 3	Model 4	Model 5
Percent Non-White (pop.)	0.040(0.006)***	0.020(0.003***)	0.057(0.021)**
Percent non-White (pop.)^2	-	-	-0.001(0.000)***
Percent Non-White (council)	-	0.006(0.002)*	-0.007(0.016)
Percent Non-White (council)^2	-	-	0.000(0.000)
Percent Non-White (police)	-	-	0.062(0.022)**
Percent Non-White (police)^2	-	-	-0.001(0.000)*
Percent Poverty	0.017(0.015)	-0.020(0.006)**	-0.022(0.019)
South	-0.199(0.275)	0.434(0.156)**	0.609(0.420)
Midwest	-0.694(0.390)	-0.250(0.229)	0.170(0.478)
West	-0.699(0.315)*	0.412(0.177)*	0.409(0.430)
Pacific	-1.062(0.336)**	0.749(0.211)***	0.673(0.545)
(Intercept)	1.234(0.395)**	1.947(0.186)***	1.537(0.617)*
ln(Alpha)	1.477(0.110)***	-	1.917(0.060)***
N	541	541	541
$***< 0.001, **< 0.01, *< 0.05$			
Wald χ^2:	(6) 88.10	(7) 187.08	(11) 64.37
$Prob. > \chi^2$:	0.000	0.000	0.000
Pseudo R^2:	0.027	0.326	0.012
DV:	% Non-White (council)	% Non-White (police)	Militarization (in 10,000s)

3.10 Figures

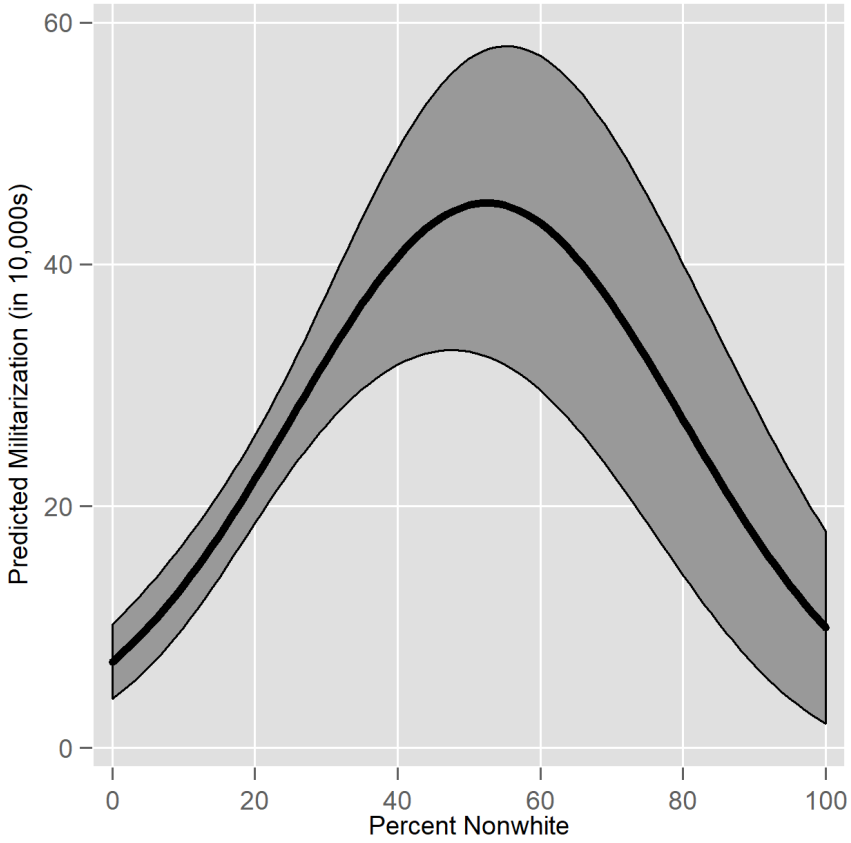

Figure 3.1 Predicted militarization (in 10,000s) by percent Non-White

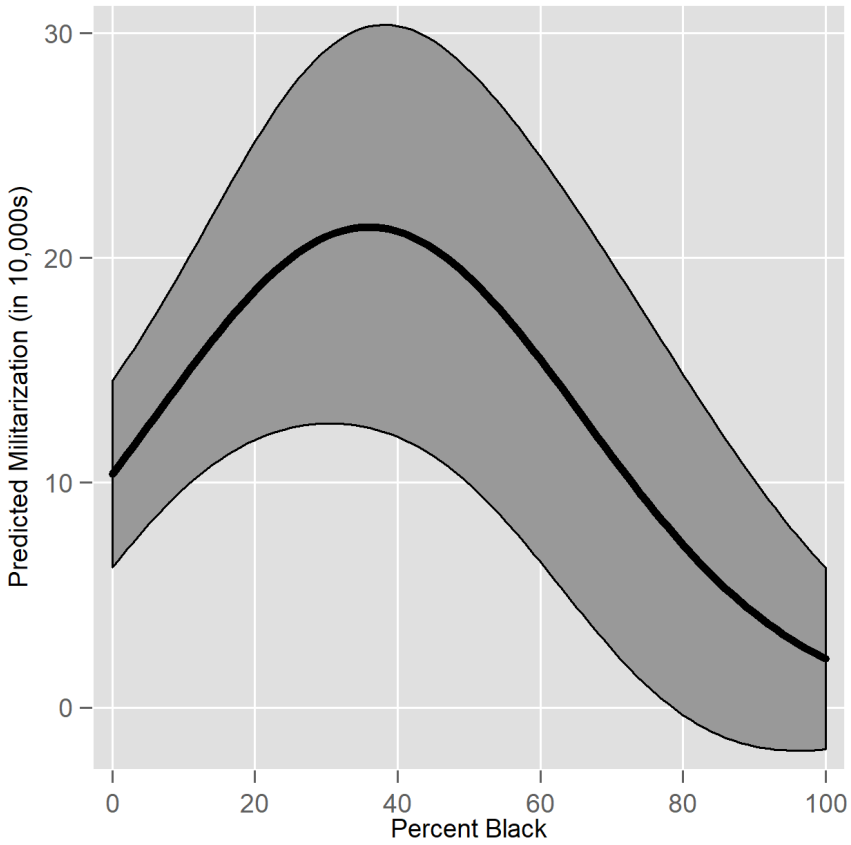

Figure 3.2 Predicted militarization (in 10,000s) by percent Black

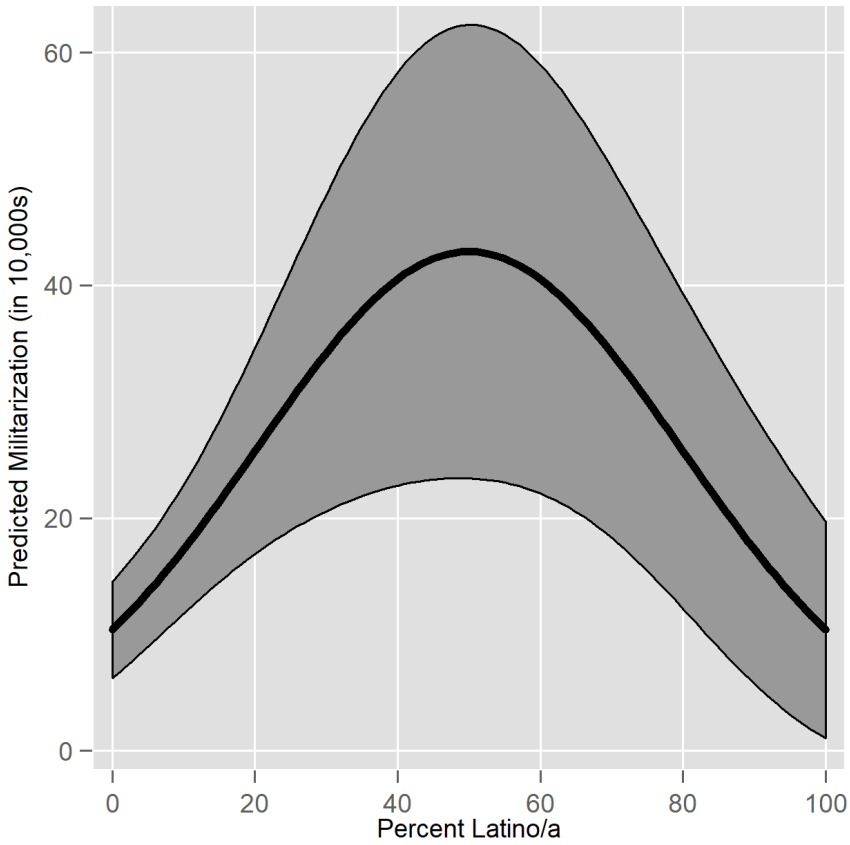

Figure 3.3 Predicted militarization (in 10,000s) by percent Latino/a

Chapter 4

Police Militarization and the Use of Lethal Force

4.1 Introduction

On August 9th, 2014, a Ferguson, MO, police officer shot and killed 18-year-old Michael Brown after an encounter the details of which are still largely unclear. The incident ignited a national debate about police practices in the United States that continues today. The aftermath raised more questions about recent trends in policing, when police officers met protesters dressed in tactical riot gear, wielding automatic weapons, grenade launchers, and tear gas, and confronting them with military-style armored vehicles (Rahall 2015). This incident brought attention to and raised questions about what is sometimes called the "militarization" of police departments in the United States, as well as a possible connection between militarization and the use of lethal violence against suspects. In this paper, I examine the relationship between militarization and the use of lethal force.

How police interact with the public is an important question in a democracy, as the police are the embodiment of the state's power to deprive citizens of rights–up to and including the right to life. Thus far, despite increasing attention toward the use of lethal force by police ("Don't Shoot" 2014), there is little research among scholars of political science and public administration on policing (though this trend seems to be changing; see Delehanty et al. (2017); Jennings and Rubado (2017); Nicholson-Crotty, Nicholson-Crotty, and Fernandez (2017); Rivera and Ward (2017)) or to determine the effects of militarization on police behavior. Instead, there is little empirical evidence to inform the contentious public debate about the behavior of police and the use of lethal force against suspects in situations

where such force may not have been necessary. On one side, leaders and representatives of law enforcement claim that the use of lethal force against a suspect is a rare occurrence (Garner et al. 1996), though sometimes unfortunately necessary, and media attention alone is responsible for the perception of excessive use of lethal force. Others have drawn a link between the militarization of police departments and civilian deaths. According to a Washington Post database, police killed 995 people in 2015, 963 in 2016, and 987 people in 2017 (Kindy et al. 2015). While there is only little apparent fluctuation from year to year, there may be characteristics of police departments–such as militarization–that can predict a higher number of deaths within their jurisdiction.

I construct a theoretical argument rooted in classic political science and public administration research on street-level bureaucrats (Wilson 1989; Lipsky 1980) and bureaucratic discretion (Brehm and Gates 1999). I argue that police have a great deal of discretion in deciding how to handle situations they encounter, and militarization affects the decision-making of police by moving their preferences toward more violent responses to suspects. Using data on the acquisition of military equipment police departments received through the 1033 military surplus program, which I acquired through a Freedom of Information Act request to the Defense Logistics Agency, and a new database on police killings of suspects in the US, I demonstrate an apparent positive and statistically significant association between militarization and the use of lethal force. To be clear, however, my argument is not that the acquisition of military hardware causes militarization or an increase in lethal force by itself. Militarization is a psychological state, for which 1033 equipment transfers are a proxy measure due to the difficulty in capturing a police department's collective mentality. 1033 transfers may cause militarization, militarization may cause an increase in 1033 transfers, or there may be some alternative variable that causes increases in both. I argue simply that there is an association between the use of the 1033 program and militarization that makes the former a reasonable proxy variable for the latter. If this theory is correct, then more suspect deaths are a consequence of increased militarization.

This paper makes three important contributions. First, my findings provide empirical evidence to the debate on police militarization. Specifically, I find a positive association between increasing militarization and the frequency of the use of lethal force against suspects. Second, introducing literature on bureaucratic behavior provides a link between police departments as organizations and police officers as individual, street-level actors, whereas prior work on police use of force focuses primarily on either individual officers (Alpert and Dunham 2004) or specific subsets of officers attached to elite units (Kraska and Kappeler 1997). This paper provides a theory and empirical measure of militarization that applies to police departments as a whole but also provides for differing behavior among individual officers. Third, I conduct what appears to be the first national, large-N study of how militarization relates to the use of lethal force, using previously unavailable data to capture the concept of militarization[1].

The next section discusses the processes through which police departments may become militarized. Next, I discuss the possible connection between militarization and the use of lethal force. I describe my data and methods after that. Next, I describe the results. Finally, the conclusion offers some possible policy recommendations and avenues for future work.

4.2 The Militarization of Police

The consensus is that over the second half of the twentieth century, police departments became more militarized (Meeks 2006). Kraska (2007) defines militarism generally as beliefs and values that emphasize the threat and use of force to solve problems. He defines militarization as the implementation of a militaristic ideology. However, the militarization of police departments goes well beyond a simple change in ideology to organizational and psychological changes in departments and police officers. There are two potential mechanisms through which police may become militarized.

[1]It is worth noting, however, that Delehanty et al. (2017) conduct a very similar study that reaches a substantively similar conclusion, but with a more limited dataset. I discuss their article in more detail below.

The first mechanism is hierarchical, encouraged by the language used by elected officials when discussing matters of law enforcement as well as cues from leaders within law enforcement agencies. The use of warlike rhetoric can have strong impacts on public attitudes and behaviors (Boggs 2005), and police are not immune to these effects. In the second half of the twentieth century and the beginning of the twenty-first, the US launched two major law enforcement-related efforts: one to eliminate drugs and the other terrorism. American political leaders call both of these efforts wars and required the participation of both the military and law enforcement in carrying out these wars. For example, President George H.W. Bush called for law enforcement to fight the drug war house by house, neighborhood by neighborhood (Meeks 2006). As drugs became more prevalent in communities, the military mindset combined with anti-drug, and more generally anti-crime political rhetoric that referred to war.

Another part of the hierarchical mechanism may be cues from police agencies themselves. Police culture appears to be the primary method of organizational control of police officers (Worden 2015). Research on the use of force by police find that officers adjust their behavior according to what agency leaders consider to be appropriate (Alpert and Dunham 2004). Similar to other organizations, officers adapt to their roles and behave according to rules within the organization, whether formal or informal (March 1994). They make decisions based on the cues they receive from police leaders and the socialization they receive from more veteran officers. Over time, new officers adopt the perspectives and preferences of the organization. Police training that emphasized the role of police officers as warriors (Stoughton 2014; Stoughton 2016) could have led to police officers seeing the communities they served as enemy territory for them to occupy and control. Police leaders see the role of their agency as one of fighting against crime, drugs, and other undesirable elements rather than one of partnership with the community. The emphasis on the warrior mindset moves from leadership to mid-level supervisors to rank-and-file officers through the training and socialization process. If a police department's leadership is militarized, the perspectives of

the officers–and their behavior–will change to match.

The second mechanism is operational, which has at least two primary components. The first is direct cooperation between the military and police forces. Traditionally, the role of the military was to provide security from external threats while civilian police protected internal security through the enforcement of laws (Kraska 2007). Kraska (2007) also notes the erosion of the 1878 Posse Comitatus Act, which established a clear separation between the military and domestic law enforcement, leading to more involvement between the military and police in internal matters. This involvement includes cross-training, cooperation in anti-drug and anti-terrorism activities, and sharing technology, weapons, and information (Kraska 2007; Kraska and Kappeler 1997; Meeks 2006). One example of this cooperation is the federal 1033 program, which provides surplus military equipment to law enforcement agencies. I use this program as a measure of a police department's militarization, which I discuss below. Through cooperation and inter-mingling, law enforcement may pick up the mindset of the military–that of a force intended to use lethal violence against an enemy as its primary function. Alternatively, police recruitment practices that involve a preference for former members of the military for hiring as new officers could have a similar effect. In either case, or both, police become militarized by adopting the same perspectives as the military, where suspects become enemies that must be violently defeated and communities become foreign territories to occupy and subdue.

The second component of the operational mechanism is the creation and expansion of elite police units modeled on military special operations forces. Alongside the wars on drugs and terror, and the new access to military training and equipment, police created special units referred to variously as Special Response Teams (SRTs), Police Paramilitary Units (PPUs), or Special Weapons and Tactics (SWAT) teams. Police departments see these teams as elite, military-style special operations units trained as use-of-force specialists (Kraska and Cubellis 1997). Although few officers receive the training, equipment, and experience that goes with being a member of these teams, such training and experience–which involves

more emphasis on the use of force–can cross over into officers who do not directly receive such training because the members of these specialized teams perform the same duties as other officers when not called to a SWAT-related action. Comparison of the use of lethal force between SWAT and non-SWAT officers shows little difference (Williams and Westall 2003).

Kraska and Kappeler (1997) and Kraska and Cubellis (1997) document the sharp increase in the number of these units around the country. In addition to the number of these units, there has also been an increase in their frequency and purpose of use. Originally intended for use in rare situations that involved hostages or barricaded suspects (Kraska and Kappeler 1997), they began to participate in more routine activities such as patrolling and serving search warrants (Kraska and Cubellis 1997). Deployments of these teams increased more than 1400% since the 1980s (Rahall 2015).

These mechanisms–operational and hierarchical–represent a trend toward increasing militarization of law enforcement. Officers become militarized by exposure to both mechanisms. New officers develop militarized attitudes by both self-selection of potential officers who already share these attitudes (Oberfield 2011), by professional socialization with other, more tenured officers (Alpert and Dunham 2004; Worden 2015), and by leadership-driven culture that emphasizes the role of police officers as warriors (Stoughton 2014). In other words, both prior ideals about policing acquired before entry into the police and early socialization with veteran officers and leaders after entry influence the psychology of police officers. In the next section, I explain how police militarization interacts with the discretion police enjoy as street-level bureaucrats to lead to more frequent use of lethal force.

4.3 Police Militarization and Using Lethal Force

A considerable literature exists on street-level bureaucrats, beginning perhaps with the initial publishing of Lipsky (1980). Street-level bureaucrats are those employees of government agencies who deal directly with the public. They are social service caseworkers,

clerks at the Department of Motor Vehicles, health and safety inspectors, etc. The central characteristic of these employees is that they engage in regular, face-to-face interaction with clients (Maynard-Moody and Musheno 2003). They also typically have significant discretion when making decisions (Wilson 1989) but take cues on how to make decisions from agency goals (Keiser 2010) and organization (Wilson 1989). Street-level bureaucrats must address interactions with citizens individually, but they also must apply policies based on routines and simplifications passed down through the organizational hierarchy (Lipsky 1980).

Police officers are a special type of street-level bureaucrat (Brehm and Gates 1999) charged with maintaining public order and apprehending those who disrupt that order. Police interact directly with citizens and typically work without direct supervision, which grants significant discretion (Lipsky 1980) and power (Oberfield 2011). Officers often must make life or death decisions in stressful situations (Wilson 1989), and discretion allows them the flexibility to choose the response they feel is most appropriate (Nowacki 2015).

These stressful situations include determining when and whether to use lethal force against a suspect. There is little evidence to suggest that police department policies are effective in restricting the use of lethal force (Nowacki 2015) and little likelihood of legal punishment for using lethal force inappropriately (Skolnick 2002). Police officers also have little reason to worry that supervisors will review their responses to routine situations frequently (Wilson 1989). This suggests that determining how to react to a given situation is largely up to the individual, based on their appraisal of the situation, their psychological state, and the cues they receive from the department itself.

That is a great deal of power for many types of government employees. But for a police officer, whose job may include the state-sanctioned use of violence, up to and including lethal force, against suspects, it is tremendous. Force is a key element of the power of police (Oberfield 2011), and citizens have little means with which to hold police officers

accountable for their actions, especially because many of the citizens that interact with police are suspects. While there are some mechanisms through which citizens may be able to hold officers accountable for their actions, such as citizen review boards, voicing public opinion to elected officials, etc., those mechanisms happen after the interaction. During the interaction itself, police have all of the power (Alpert and Dunham 2004; Thomann 2015). This means that officers largely use their own judgment when deciding whether to use lethal force, and it is plausible that militarization may shape this judgment.

In any encounter, both police officers and citizens attempt to maintain their own authority despite the asymmetrical distribution of power between them (Alpert and Dunham 2004). When one side fails to provide the respect for authority that the other side expects, or when one side blocks the other from pursuing its goals, then the result may be citizen resistance, the use of force by the police, or both. The confrontation escalates until one party changes its goals and, thus, its behavior. That escalation occurs along a continuum from minimal to extreme force (Worden 2015).

Discretion provides police officers with the ability to choose how to respond to a given situation. For example, an officer confronting an armed suspect may attempt to negotiate with the suspect so they give up their weapon voluntarily. The officer may use less-than-lethal force such as a taser or physical violence to subdue the suspect. Or the officer may attempt to kill the suspect. Each of these options is a potentially valid choice, and each could potentially resolve the confrontation. Militarization is a psychological transformation within police departments–and officers–that shifts behavior toward lethal force as a more acceptable and earlier response.

Imagine that, for a given police officer in a given situation, the universe of possible responses from which the officer can choose is on a one-dimensional continuum arranged from least violent to most violent (Terrill 2005; Worden 2015). On one extreme, perhaps, is the option for the officer to do nothing. On the other extreme, the officer may summarily execute the suspect involved. Between these two extremes lies every other possible

alternative response to the situation. Of course, not every possible alternative along this continuum would be either legally or morally acceptable, to the officer or to his supervisors (and, despite the general lack of supervision for police officers, summarily executing a citizen suspected of jaywalking, for example, would likely lead to disciplinary action and criminal prosecution simply due to the extremely disproportionate response). Each officer, then, has a subset of possible alternatives that he or she believes would be acceptable choices for that given situation. This window represents the realistic options from which the officer chooses. Within that window of acceptable options, then, is the specific response the officer believes to be the most preferable for that given situation.

After choosing a response, the officer then adjusts that choice based on the response of the suspect. If the suspect surrenders and complies with the officer, then the situation is resolved. If the suspect draws a gun and fires, the officer escalates his or her own response. If the suspect signals defiance without resorting to violent resistance, such as verbal defiance, nonviolent resistance (such as laying on the ground and refusing to move), or fleeing, the officer will also escalate to a more violent response to subdue the suspect. It seems plausible to assume that, usually, any adjustment to an initial response will likely be an adjustment toward the more violent end of the continuum rather than to the less violent end. So an encounter with a suspect is, essentially, the process of choosing the most preferred initial response from within the subset of acceptable responses, and escalating toward more violent responses until the situation resolves. In other words, the use of force by a police officer is an iterative process that continues until the encounter ends (Alpert and Dunham 2004; Goldstein 1979).

Due to the operational and hierarchical changes discussed above, militarization may change how this iterative process works. Officers take cues from their superiors and the characteristics of the organization (Scott 1997), and in a militarized department the window of acceptable options may move toward the more violent extreme of the continuum. If the officer is taking cues on what actions are acceptable from his superiors within the

department— based on, perhaps, agency objectives (Keiser 2010; Thomann 2015)—then he or she may believe that, within a militarized police department, more violent responses to suspects are acceptable or more desirable. Additionally (or alternatively), militarization may move an officer's preferred choice within the window of acceptable responses toward the more violent, because the officer's psychological state is more militarized and, therefore, more violent.

In either case, the officer's psychological state changes based on adoption of the culture and perspectives of the organization's leaders and the officer's colleagues. Thus, while discretion and street-level decision making are individual processes, they also involve the police department as a whole. Furthermore, while research suggests that suspect behavior is the primary determinant of an officer's response to that behavior (.Friedrich 1980; Garner et al. 1996), militarization may influence the officer's psychological state, which would then influence the officer's response. Police use of force is, essentially, a matter of psychology (Alpert and Dunham 2004). The officer may perceive a suspect as more of a threat due to this psychological tendency toward violence. Alternatively, the officer, unable to consider all possible alternatives and consequences to possible actions in such a short period of time (March 1994), may simply adopt a more violent response as a matter of convenience. Thus, the officer begins with a more violent response toward a suspect and, if escalation is necessary, moves toward increasingly violent responses more quickly. The result is that militarized police will resort to violence more often and more quickly than non-militarized police, which means militarized police will use lethal force more frequently. This leads to my hypothesis:

As police departments become more militarized, they will kill suspects more frequently.

4.4 Data and Methods

To test my hypothesis, I began with a master list of all non-federal and non-state law enforcement agencies in the United States from the 2008 Census of State and Local Law En-

forcement Agencies. The number of suspect killings is from Fatal Encounters[2], a database created with the goal of collecting information on law enforcement-related deaths. This is currently the most comprehensive database of the use of lethal force by police available. Due to limited data availability for the militarization variable (discussed below), I restrict the time period to the fourth quarter of 2014 through the fourth quarter of 2016. Fatal Encounters includes data on the victims of lethal police violence over this time period in all fifty states. Most of the information in Fatal Encounters comes from newspaper articles and other public records, allowing for easy fact-checking and verification. The final data for analysis consist of 11,848 observations of law enforcement agencies with either county-wide or sub-county jurisdiction from the fourth quarter of 2014 through the fourth quarter of 2016.

My dependent variable for all hypotheses is the number of people the law enforcement agency killed during each quarter over the period of analysis. The source of this variable is the FatalEncounters.org database, which contains records of individual suspects killed by police, aggregated to a count of the number of people a police department killed in each quarter. For example, if three people in the fourth quarter of 2014 died as a result of activity of a particular police department, that agency-quarter observation's value for the dependent variable will be three. The agency-year count ranges from zero to 9 deaths, with a mean of 0.019, and variance of 0.035[3].

Fatal Encounters is a free database administered by D. Brian Burghart, former editor/publisher of the Reno News and Review and journalism instructor at the University of Nevada-Reno. Volunteers and paid researchers use media reports and public records to contribute information about the killing of suspects by police that includes the victim's name, race, age, the location of the incident, the agency responsible, and other incident-specific

[2]www.fatalencounters.org

[3]I use quarterly data because it is subject to the least amount of aggregation effects. For a supplementary analysis using data aggregated to years, see the appendix. Results are substantively similar.

information. It is still a work-in-progress, but is complete for all 50 states and Washington, DC, from 2013-2016, and is nearing completion for all years going back to 2000. While it is a fairly new database, scholars are already using it in studies of lethal force (Delehanty et al. 2017; Jennings and Rubado 2017; Lawson 2019).

My primary explanatory variable of interest is the value of military hardware each agency possessed in each quarter from the fourth quarter of 2014 through the fourth quarter of 2016, adjusted for inflation to 2016 dollars, divided by 10,000 to keep the coefficient sizes manageable[4]. I lag the variable by one quarter because police departments may request and receive items through the 1033 program at any point in a quarter, so it seems more sensible to lag the variable in order to adequately capture the level of militarization that it represents. Lagging the variable also helps to account for a potentially endogenous relationship between use of the 1033 program and the number of suspects killed in a quarter[5,6].

4.4.1 Control Variables

As plausible as the link between militarization and the use of lethal force seems to be, there may be other explanations. It certainly is not the only cause of the use of deadly force. There may be some other factor or factors driving the use of lethal force by police. I explore a brief theoretical basis for each mechanism in the sections that follow, and I describe their inclusion in my analysis as control variables.

[4]The appendix includes models using several different measures of militarization, such as the log of this total dollar value, the total number of items received, and dummy variables indicating whether a police department received items of high value. In models that involve dollar values of equipment in some way, the results remain positive and significant. The total number of items was statistically insignificant.

[5]As an additional test for endogeneity, I ran two additional OLS models that included a lagged number of suspect deaths and militarization as the dependent variable: one with two-way random effects and one with standard errors clustered by agency. This analysis suggests there is no endogenous relationship between suspect deaths and militarization.

[6]It is also worth noting that the military's level of surplus equipment drives what is available to police through the 1033 program, not the level of demand for such equipment from police departments (Harris et al. 2017).

Population. High populations may increase the use of lethal force simply because there are more people for police to encounter. In a high-population area, the per capita number of police officers will likely be lower than in low population areas (even if the raw number of police officers is higher). That sense of being outnumbered alone may evoke a sense of threat among police officers, who feel a need to protect themselves against the threat. They may react to suspects with lethal force more quickly to avoid becoming the victims of a mob. Moreover, it may be the case that large police departments, which serve communities with larger populations, tend to have less supervision for street-level officers because the larger number of officers stretches the supervisors thin (Nowacki 2015). On the other hand, larger police departments may use lethal force more often simply because there are more officers and more people for them to use such force against. Population, then, serves as a proxy variable for the size of a police department and allows me to account for different behaviors from police departments of different sizes and to account for differences in the number of suspect deaths based on population, which reduces potential bias in model estimates. I obtained populations from the 2013 Law Enforcement Management and Administrative Statistics, which lists the total population each police department served within its jurisdiction in 2012. While these data are two years old at the starting point of my analysis, it is unlikely these numbers changed by any large amount over that period.

Poverty. There also may be a connection between poverty and the use of lethal force (Hirschfield 2015). There may be two reasons for this. The first is that, to police, poverty suggests danger because officers associate problem places with threats to officer safety (Terrill and Reisig 2003). Impoverished areas tend to also be high crime areas, particularly violent crime (Hsieh and Pugh 1993), leading to officers fearing for their safety when present in these areas. Thus, higher levels of poverty should lead police to use lethal force more often out of a greater perceived need for self-defense. Second, poor people make up a traditionally marginalized demographic (Terrill and Reisig 2003). Police may use lethal force more frequently in high-poverty areas as a means of social control over the poor

(Chevigny 1990). I measure poverty as the percent of the population within a police department's jurisdiction with income below the poverty line. This information came from the 2015 American Community Survey and is at the level of US Census Place for sub-county police departments and county for county-level departments.

Race. Research suggests police are more likely to use force, including lethal force, against members of minority racial groups (Terrill and Reisig 2003). The most likely explanation is an extension of the social control argument discussed in the previous paragraph. The difference, however, is that the target of that control is a racial minority rather than the poor. Within the US, that race is most likely African Americans, given the long history of both legal and social oppression suffered by that group. Additionally, police assume African Americans tend toward crime more than whites, and view them with greater suspicion (Werthman and Piliavin 1967). It also seems that areas with higher populations of African Americans have a higher frequency of police violence (Jacobs and O'Brien 1998). There may be a similar effect in areas where the largest minority is Hispanic, rather than black. While officers may not be intentionally or consciously targeting racial minorities, implicit biases that lead to harsher treatment of minorities may still exist (Smith and Alpert 2007). I include the percentage of the population, again by US Census Place, that is African American and the percentage that is Hispanic from the 2010 US Census. For the African American population, I include the proportion that is African-American but not Hispanic in order to avoid overlap between the two variables. Again, while these figures are somewhat dated, it is unlikely that the numbers changed a great deal.

Violent crime. This is likely the most obvious alternative explanation for an increased use of lethal force. Violent crime, rather than all crime, should lead to this effect due to the more serious nature of those crimes compared to others, such as property crime. Violent crime presents a much higher potential threat to officer safety than property crime, so violent crime should be a more reliable measure of crime as it relates to the use of lethal force. Police officers should become more aggressive and more punitive when in high violent

crime areas because high levels of crime mean an increase in the probability of violent interactions with the public (Bayley and Mendelsohn 1969; Terrill and Reisig 2003). That aggression, then, means more frequent use of lethal force against suspects. For violent crime, I use the number of violent crimes per 10,000 people at the county level. At the time of writing, these appear to be the best available data on violent crime.

While the measures for poverty, crime, and racial minority populations may seem to overlap significantly, they each represent distinct explanations for the use of lethal force by police. Violent crime represents a direct threat to officer safety. Areas with high levels of violent crime mean that officers will likely encounter violent crime more often, which threatens their own safety. Areas with high poverty and large minority populations may experience high levels of violent crime, but police may also be more likely to use lethal force as a means of social control of these groups regardless of crime. Moreover, the correlations between each of these measures are modest at best (the highest being 0.389), so there is no risk of multicollinearity by including them in the model.

Budgetary Resources. The most frequent participants in the 1033 program seem to be smaller, more rural police departments with fewer resources (Molina 2014). It seems plausible that police departments with greater financial flexibility could potentially use their own departmental resources to purchase equipment that smaller departments receive through the 1033 program. In such a case, these departments would be more militarized than they appear in the data using the 1033 program as a proxy, because they received the same or similar kinds of equipment without using that program. The militarization measure correlates with total department budget at 0.31, suggesting that this sort of substitution effect is not present. However, budgetary flexibility may still influence the use of lethal force due to its potential effect on hiring. Police departments with less budgetary resources may have more limited options for hiring due to the salaries, training, etc. that they can offer. This may lead some departments to hire officers that are less professional, or to provide new officers with less training, both of which could lead to more incidents of lethal force. Thus,

it is important to control for a police department's budgetary situation. I use the 2013 Law Enforcement Management and Administrative Statistics survey, which asked for each department's operating budget for the year that included January 1, 2013. I divide this amount by the total number of sworn officers to account for department size, and I divide the resulting amount by 10,000 to keep coefficients manageable. This measure better captures the concept of "budget flexibility," as such a concept seems to involve both financial resources and department size, rather than simply the size of a department's budget[7].

County-wide jurisdiction. Having county-wide versus sub-county jurisdiction may have an impact on the use of lethal force. Most police work is not done at the county level. County-wide police departments operate in more rural areas with lower populations and population densities, which means they may simply come into contact with fewer people. Contact with fewer people means fewer opportunities to use lethal force. However, departments with sub-county jurisdiction perform most police work, operating in larger towns and cities with higher population densities and interacting with more people. I incorporate county-wide jurisdiction into my analysis using a binary variable which indicates whether a particular police agency has county-wide jurisdiction.

4.4.2 Model Specification

The first conclusion one may draw from these data is that the dependent variable is overly dispersed. Using a negative binomial model is appropriate. Second, there are a lot of zeros, because suspects that police officers kill are a relatively small fraction of the total number of people officers encounter in a quarter. I use a zero-inflated negative binomial model in order to account for the excessive zeros which, according to the assumptions of

[7]In addition, total budgets correlate with population at around 0.9, which likely introduces multicollinearity into the model. This budget-per-officer variable correlates with population at around 0.24.

the ZINB model, come from a process distinct from a zero count[8] (Zeileis, Kleiber, and Jackman 2007). Results of a Vuong test suggest that the zero-inflated negative binomial regression model more closely captures the process that generated these data than a simple negative binomial model ($p < 0.000$).

4.5 Results

Table 2 depicts the results of this model[9]. The top section of the table is a truncated count model measuring the impact of each variable on the predicted probabilities of each ascending count level, while the bottom section is a logit model measuring the impact of each variable on the occurrence of an excess zero in the data. Thus, I expect the coefficient for militarization to be positive in the top section and negative in the bottom. The coefficients measure the change in log odds so they are not directly interpretable, but there are some conclusions to take from these results.

Militarization has a positive and statistically significant($p < 0.05$) association with the number of lethal force incidents, but has no significant association in the zero-inflation model. This suggests that militarization has an effect on the use of lethal force by police, specifically by increasing the number of suspects police kill in a quarter, all else equal. The results provide support for the hypothesis that as militarization increase, so does the

[8]A model that incorporates two-way fixed effects would be desirable to account for unobserved variation between agencies and years. Unfortunately, fixed effects models drop cross-sectional units with no variation in the dependent variable. Because there are a large number of these units (i.e. entities with zero deaths), and because the lack of variation is due to the dependent variable being zero across all years, that leads to a large decrease in the number of observations. Those zeros are theoretically relevant, however, and dropping them distorts the analysis. In addition, having a variance greater than the mean suggests overdispersion in the dependent variable, so I use a zero-inflated negative binomial model for the analysis. These results are robust to several other model specifications. For additional statistical models used as robustness checks, see the appendix.

[9]While this analysis uses quarterly data, I also run a robustness check using annual data. This alternative model uses the lagged average annual total of the militarization measure and aggregates suspect deaths to the year rather than the quarter, in case using quarterly data somehow biased the results. The conclusions are substantively similar. See the appendix for this alternative model.

number of suspect deaths. The zero-inflation model measures the effect of each variable on the occurrence of a zero in the dependent variable, so the null result suggests militarization has no effect whether police kill any suspect in a particular quarter or not. The relative rarity of both high levels of militarization and of killing suspects (particularly more than one per quarter) may be affecting the calculation of the zero-inflation model. Alternatively, other factors that are significant in the zero-inflation model may account for most of the influence on the change from a zero to a one, while militarization has a stronger influence on moving from one death to a higher number. It may also be the case that militarization does not affect the likelihood of a police department killing no suspects, but for police departments that kill at least one suspect increased militarization makes them more likely to kill more than one.

Substantively, how many deaths should be expected as militarization increases? The raw coefficients for these models cannot answer these questions due to the difficulty of interpretation. I calculated predicted counts with 95% confidence intervals for each, presented in Figure 2, which depicts the predicted number according to the model. There is a fairly steady increase in predicted deaths as militarization increases, though the confidence interval widens slightly more at higher levels. While my measure of militarization does not directly capture the psychological process, it seems safe to conclude that militarization has a positive and significant association with how frequently police kill suspects.

According to Figure 2, the model predicts one suspect death at a militarization level of around 375 (or $3,750,000). The expected number of deaths increases to two at around 500 (or $5,000,000). It then doubles to 4 deaths at around 750 (or $7,500,000). It is important to note, however, that few police departments in the sample reach such high levels of militarization. A value of 400 in the militarization measure (which corresponds to $4,000,000 in military equipment) is around the 99.5 percentile. While the highest level of militarization in the sample is 1036.0592 (the Houston Police Department in the 3rd quarter of 2016), the extremely skewed nature of this variable means that few police departments even get

close to that amount. Still, this result supports to the claim that militarization influences the killing of suspects by police.

Next are the results for the control variables. There is a positive and significant association between population and the number of lethal force incidents ($p < 0.05$) and a negative, significant ($p < 0.001$) association between population and the likelihood of a zero. Thus, population seems to both increase the number of suspects killed and decrease the likelihood of a zero. Poverty is not significant in either section, suggesting that lethal force may not be a method of social control of the poor.

The percentage of the population that is Hispanic also has no association with the number of suspect deaths in either the count model or the zero-inflation model. Results for the percentage of the population that is black are somewhat counterintuitive. This variable has an insignificant relationship with the number of deaths and with the likelihood of zero deaths. Taken together, the previous two variables seem to suggest that the racial composition of an area has no effect on how often police use lethal force against suspects.

The violent crime rate's result is as suspected. It has a positive and significant association with the total number of suspect deaths ($p < 0.05$) but no association in the zero-inflation model. The results suggest, in line with the theoretical argument, that police departments in higher-crime environments will use lethal force more frequently. However, the jurisdictional level of the agency also plays a roll. Having a county-wide jurisdiction has a negative and significant association with the frequency of suspect deaths ($p < 0.001$), but also a negative and significant association with the likelihood of a zero ($p < 0.05$). This is a seemingly contradictory result, but perhaps it makes more sense than would be apparent initially. It is possible that agencies with county-wide jurisdiction, who may also serve larger populations than sub-county police departments, are more likely to kill at least one suspect in a quarter, but some other factor, such as the higher likelihood of serving primarily rural rather than urban populations, means the total number remains relatively low. Finally, operating budget per officer has no association with the frequency of lethal force.

4.6 Conclusion

This paper represents an important contribution to a contentious public debate by studying the impact of police militarization on the number of suspects that police officers kill. Results of a zero-inflated negative binomial regression model with a dataset of over 11,000 agency-quarter observations support the hypothesis that there is an association between militarization and suspect deaths. In other words, increasing militarization corresponds to more suspect deaths, *ceteris paribus*. In addition, this paper presents a theoretical argument that combines institutional attributes of police departments and the roles and behavior of individual officers to explain how militarization affects the decision to use lethal force.

Other factors also seem to influence the use of lethal force. The variables with a significant effect on the frequency of lethal force are the total population, the rate of violent crime, and the jurisdictional level of the police department. County-wide jurisdiction seems to decrease the number of suspect deaths, while the other variables increase that number. Racial minority populations seem to have no effect.

The results of this paper have important implications. If society agrees that increasing the number of people killed by police is undesirable, steps should be taken to reduce the number of suspect deaths either through reducing militarization or, possibly, by reducing the extent to which militarization can affect officer behavior. What steps may counteract this increase in lethal force is a question for future work, but some scholars and activists propose several potential avenues. One potential solution is rethinking the process of training officers so that, for example, they learn to build connections with their community through non-enforcement interactions and to use tactical restraint in order to minimize the risk of an enforcement action escalating to violence (Stoughton 2014). Other policies regarding oversight of police behavior and strengthening policies on acceptable use of force, as well as consequences for violating those policies, are also possible mechanisms for reducing the use of lethal force . More broadly, a new emphasis on principles referred to as Guardian Policing–as opposed to Warrior Policing–seeks to instill values based more on public ser-

vice through crime prevention and control than on fighting crime (Stoughton 2016).

Other potential future directions for research are to continue exploring how race fits into the operation of police departments and the behavior of officers and other aspects outside the scope of this paper: causes of militarization; how officer psychology, such as militarization, affects officer behavior toward suspects and other civilians; how agency-specific training and supervision play a role; and other potentially important topics relating to policing. Improved data resources and possibly experimental research should play a role in expanding this literature. Scholars are now making greater strides in the study of policing, and there is wide latitude for increase the scope of this research area.

4.7 Tables

Table 4.1 Chapter 4 Summary Statistics

Variable	Min	Mean	Max	Std. Deviation
Deaths	0	0.019	9	0.187
Militarization (divided by 10,000) (lagged)	0	6.415	2322.100	35.798
Population (divided by 10,000)	0.020	10.776	996.279	57.129
Percent Poverty	0	16.968	89.6	8.828
Percent Latino/a	0	11.056	100	16.848
Percent Black	0	11.385	98	18.294
Violent Crimes per 10,000	0	7.409	114.943	8.818
Budget per Officer (divided by 10,000)	0.836	13.402	140	7.818
Countywide	0	0.211	1	0.408

Total N = 11,848

Table 4.2 ZINB Regression, effect of militarization on deaths

	Count model	Zero-Inflation model
Militarization (lagged, divided by 10,000)	0.001(0.000)*	-0.001(0.002)
Population (divided by 10,000)	0.005(0.002)*	-0.222(0.063)***
Percent Poverty	0.006(0.015)	-0.005(0.021)
Percent Latino/a	0.011(0.008)	0.005(0.011)
Percent Black	0.004(0.006)	-0.002(0.007)
Violent Crime Rate	0.019(0.009)*	0.003(0.014)
Budget per Officer (divided by 10,000)	0.000(0.014)	-0.015(0.027)
Countywide	-1.530(0.187)***	-0.774(0.374)*
(Intercept)	-1.340(0.481)**	3.418(0.485)***
ln(Alpha)	-0.784(0.675)	
N	11,848	
$***< 0.001$, $**< 0.01$, $*< 0.05$		
Wald $chi^2(8)$ = 255.18	$Prob. > chi^2$ = 0.000	
DV = Number of suspect deaths		

4.8 Figures

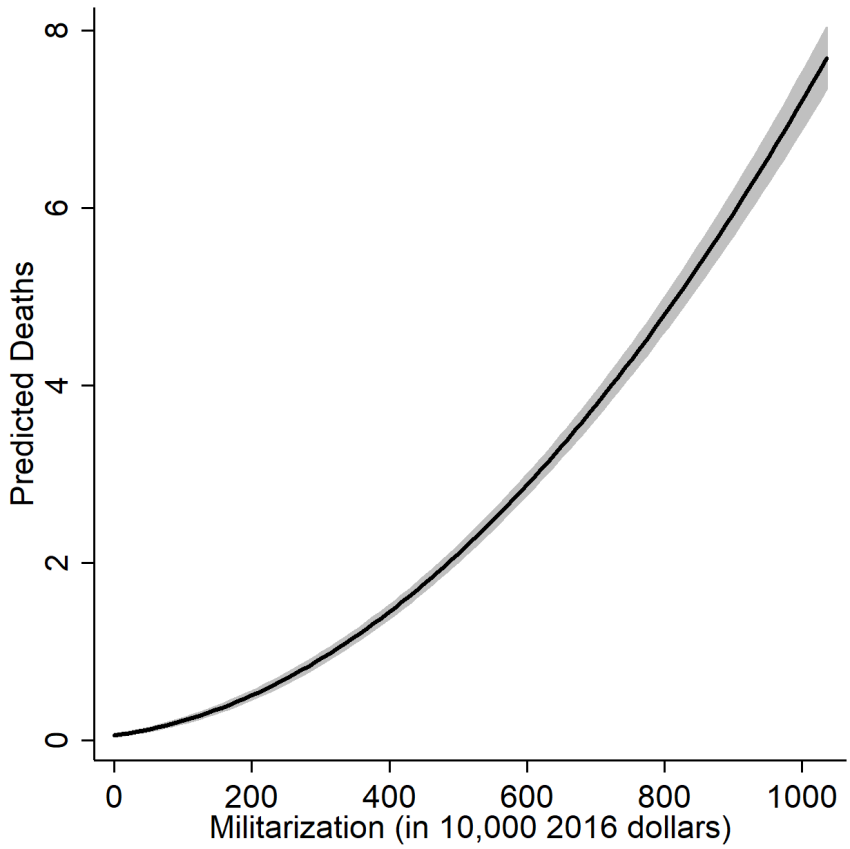

Figure 4.1 Predicted number of suspect deaths at varying levels of militarization, with 95% confidence intervals (in gray).

Chapter 5

Watching the Watchers: Police Violence and Body-Worn Cameras

5.1 Introduction

After the 2014 shooting of Michael Brown in Ferguson, MO, calls for police agencies to require the use of body-worn cameras dramatically increased. The shooting led to protests, violent police response, and an intense public debate over the nature of police work and the use of force by police officers. Brown's mother publicly called for police to wear cameras (Aton 2016), and many credit Brown's death as the catalyst that created a national movement advocating body camera use (Sanburn 2014; Somashekhar et al. 2015). Then-President Barack Obama requested $75 million to purchase 50,000 body cameras for law enforcement agencies around the country, claiming that evidence found cameras elicited more positive behavior from officers and the public and that cameras improved accountability and transparency (Friedman 2014). Proponents of body cameras frequently cited these effects as the reason for police to adopt body cameras, and support for body cameras quickly became widespread likely due to the apparent simplicity of the solution to a difficult problem (Developments in the Law 2015). Surveys continue to find considerable support among the public. One survey found that 77% of respondents said they would feel safer if officers wore body cameras, and 74% said that police departments should require officers to wear cameras[1]. A recent Cato Institute/YouGov poll found 89% support for the

[1] http://www.news9.com/story/26345123/arrest-of-okc-officer-highlights-benefits-of-body-cameras

use of body cameras[2]. Pew found 93% support, with 66% of police officers themselves supporting the use of body cameras[3].

The call for body cameras on police brought on what Brehm and Gates (1993) refer to as a compelling intellectual puzzle: how, and whether, to police the police. In moments of public crisis and moral panic, such as the aftermath of the Brown shooting (and that of many high-profile police killings since), the policy environment becomes considerably more fluid, and enacting new policies to solve these crises becomes easier (Newswander 2012). The claims of supporters framed body cameras as the one solution that could prevent another Michael Brown shooting in the future seemed, initially, to be fairly reasonable: video and audio recordings provide an objective view of events from a police officer's perspective, solving the problem of uncertainty over what actually happened in an interaction between a police officer and a civilian (Wasserman 2014).

Despite claims to the contrary, evidence regarding the effects of body cameras was quite limited (Drover and Ariel 2015; White 2014). Fortunately, as support for body cameras increased, so did scholarly interest, and the study of body cameras increased rapidly (Ariel 2017; Ariel, Farrar, and Sutherland 2015; Ariel et al. 2016b; Ariel et al. 2016a; Developments in the Law 2015; Jennings, Friddell, and Lynch 2014; Jennings, Lynch, and Fridell 2015; White 2014). Unfortunately, the results of these studies, which mostly relied on various experimental designs, are largely mixed. Today there is still no scholarly consensus on even the simplest questions regarding body cameras and their effects on police and civilian behavior.

This paper attempts to contribute to the on-going examination of body-worn cameras. By taking advantage of a federal grant program from 2005, the Body-Worn Camera Pilot Implementation Program, I use a dataset of more than 2,000 local and county law en-

[2]https://www.cato.org/survey-reports/policing-america

[3]www.pewsocialtrends.org/2017/01/11/police-views-public-views/

forcement agencies to examine what factors lead these agencies to pursue body camera programs–a question that, as yet, seems to be not only unanswered, but unasked–and what effects the pursuit and implementation of body camera programs has on police officer behavior in the future. I argue that the public empowers police with the authority to use force to protect the safety of civilians and other police officers, but they expect police to only use force when necessary and in an amount that is appropriate for the situation (Ariel, Farrar, and Sutherland 2015). Militarization–which I define as a process that involves increasing emphasis on the use of force as an acceptable, or desirable, way to solve problems–causes a divergence between public and police officer goals and values, creating a principal-agent relationship (Miller 2005) where the agent, the police, favors behavior that violates the expectations of the principal, the public. More militarized police use force earlier, more often, and more severely, resulting in more frequent civilian deaths (Lawson 2019). Unnecessary killing of civilians violates the implicit social contract between the public and police (Pettit 1997; Rousseau 1987 [1762]; Shapiro 2003), leading to greater tension between the two and undermining police legitimacy (King and Waddington 2004; Weitzer 2000; Weitzer 2002; Westley 1970). The public demands greater transparency and accountability, and police agencies respond by pursuing policies to provide it. Given the highly salient nature of body cameras, that is likely to be a common policy option chosen, and police departments should be more likely to pursue body camera programs when they kill civilians more often. The Body-Worn Camera Pilot Implementation Program provides a useful dataset to examine this question, as it provided federal funding for police officers to create a body camera program. In addition, police departments that received a funding grant should have killed fewer civilians later.

In the next sections, I lay out my theory of the principal-agent problem of police violence in more detail and discuss the specific mechanisms through which body cameras may constrain police officer behavior. Next I discuss the current state of research on body-worn cameras and the Body-Worn Camera Pilot Implementation Program. The following section

discusses my data and methods specifically. Next I interpret my results. The final section offers some conclusions and implications.

5.2 The Principal-Agent Problem of Police Violence

A fundamental aspect of democratic theory is that individual people concede certain freedoms to some governmental structure in exchange for that structure's protection of certain other rights (Hobbes 1928 [1651]; Rousseau 1987 [1762]). Americans, through local government, endow law enforcement agencies with significant power over their lives, including the power to take away rights that government otherwise protects, so that those agencies (and government more broadly) may provide public goods such as safety and order (Moe 1984), with the expectation that such power will be used responsibly. Police are a party to this contract (Pettit 1997; Shapiro 2003). And, because of the nature of police work–requiring officers to make fast decisions in complicated and tense situations–they operate as street-level bureaucrats (Lipsky 1980) with considerable discretion (Davis 1969; Friedman 2017; LaFave 1965; Sklansky 2007; Weitzer and Tuch 2005; Wilson 1989). The criminal procedure process defers to police discretion by default (LaFave 1974; Luna 2008-2009; Fan 2011) and, when police officers make judgement calls on the job, others typically ask few, if any, questions (Ginsburg 2007).

Law enforcement agencies may take away an individual's rights if that individual is credibly suspected of committing an offense against the behavioral norms of the society in which the individual lives and, therefore, presents a danger to other members of the society. In some situations, protecting the larger society from danger requires the use of force against an individual, but there is an expectation that police officers will only use force in those situations that require force for legitimate purposes (Alpert and Smith 1994; Atherley and Hickman 2014; Bittner 1970). The public expects police officers to only use lethal force when there is no other alternative. Killing a person is the most extreme form of rights removal–removing the right to life itself–and so law enforcement agencies should

only do so under extreme circumstances.

The process of militarization, however, affects police perceptions of when the use of force, particularly lethal force, is appropriate. Militarization is the implementation of a militaristic ideology, which is a set of beliefs, values, and assumptions that emphasize the use and threat of violence as an appropriate, or even desirable, way to address problems (Kraska 2007). Police departments have a distinct subculture (Westley 1970), but different departments and officers emphasize different aspects of that subculture (Paoline 2003; Paoline 2004). When police departments–and their officers–become more militarized, they begin to see the use of force as a more acceptable action when in the field (Kraska 1996; Kraska 2007; Adelman 2003). Typically, police officers encountering a suspect choose an initial action from a range of possible actions within a window of appropriate options that fall on a continuum from least to most violent (Worden 2015). If the suspect complies with the officer, the situation resolves. If the suspect resists, the officer escalates by moving to new actions on the continuum towards the more violent end until achieving resolution. Police that are more militarized either select an initial action closer to the more violent end of the window of appropriate actions, or select from a window that itself moves toward the violent end of the continuum, or both, resulting in more civilian deaths (Lawson 2019).

Militarization creates a principal-agent problem. Principal-agent theory involves an asymmetric relation between an authority–the principal–and another party–the agent–who the authority essentially hires to carry out one or more particular tasks for the authority (Miller 2005). The principal expects the agent to perform its tasks to benefit the principal. The asymmetry is in the form of both information and power. The authority has the power to sanction the agent if necessary, but the principal is unable to directly monitor the agent's behavior. If the agent's goals differ from the principal's, the agent may pursue his or her own goals instead, with the principal unable to effectively supervise the agent. The inability to supervise means an inability to sanction, so the principal cannot alter the agent's behavior.

Principal-agent models are most common in political science in studies of control of

bureaucratic agencies, by Congress or similar legislature (Fiorina 1982; Fiorina 1986; Hill 1985; Weingast 1984; Weingast and Moran 1983), the president or similar executive (Bendor, Taylor, and Van Gaalen 1985; Moe 1982; Wood 1988), or both (Wood and Waterman 1991). Other research examining political phenomena in a principal-agent context involves local government contracting (Stein 1990) and the role of interest groups in policy formulation (Banks and Weingast 1992). In the case of police, although prior literature that applies a principal-agent framework to police position either internal leadership or external political officials as principals (Brehm and Gates 1993; Chaney and Saltzstein 1998) the public is the ultimate principal for bureaucratic agencies despite any intermediaries (McCubbins, Noll, and Weingast 1987), police the agent. Militarization leads to diverging goals between them. Though some past research that frames policing in the context of principal-agent theory refers, broadly, to two outcomes: working, or police carrying out their duties, or shirking, police spending their time at the proverbial donut shop (Brehm and Gates 1993; Brehm and Gates 1999). Militarization introduces a third behavior option: carrying out their duties in a way that police may prefer but that the public opposes. The public wants police to use the minimum force necessary to carry out their function (Alpert and Smith 1994; Ariel, Farrar, and Sutherland 2015; Bittner 1970), and to use lethal force only when absolutely necessary.

Militarized police see the use of force–including lethal force–as an acceptable or desirable way to address problems they encounter, and so they kill more civilians than they would had they not become militarized. Due to the discretion police enjoy, the largely unsupervised nature of their jobs, and the general deference to their decisions, the public has no real means of sanctioning police for killing excessive numbers of civilians. But using unnecessary or excessive force violates the social contract, which causes tension between the public and police (King and Waddington 2004; Weitzer 2000; Weitzer 2002). The public should respond to this violation through the political process, either directly to police in the case of elected sheriffs or to appointed police chiefs through local elected officials,

by pushing for policy changes that would constrain the behavior of police officers and promote greater accountability. Most recently, a popular policy change is the implementation of body-worn video cameras.

5.3 Self-Awareness and Deterrence Constraining Police Behavior

The use of video cameras to both assist police and prosecutors in evidence gathering and to capture inappropriate actions taken by police officers, though early on this involved the use of dash-mounted video cameras in police cars[4] (Alpert and McLean 2018). Dash cameras proved to be successful, as they reduced citizen complaints and frequently cleared officers of accusations of wrongdoing. In addition, they proved to be a useful resource for prosecutors, with a recent survey reporting that 91% of prosecutors saying they had used video evidence during a trial (ManTech Advanced Systems International Inc. 2012), but dash cameras could not move. They were stuck facing the same direction as the officer's vehicle, so they could not capture events happening away from the front of the vehicle. Today, reformers, including former President Obama, advocate for a similar policy solution to improve transparency and accountability in police-citizen interactions and to influence the behavior of police officers and civilians during interactions: body-worn cameras (Friedman 2014). Body-worn video cameras are small devices capable of being mounted on a variety of locations on an officer's body–for example, a pocket, a lapel, an epaulette, etc.—and recording audio and video more closely to a direct officer's perspective than an in-car system. Though they require additional resources such as training officers when and how to record, storage and management of large amounts of video and audio data, and attention to maintaining proper chain of custody for court proceedings, many claim body-worn cameras can deter negative behaviors from officers and civilians, promote officer safety, im-

[4]The primary purpose for installing dash-mounted cameras in police cars was to capture evidence to use against drunk drivers, though proponents also argued for additional benefits such as assisting with prosecution of other crimes, capturing inappropriate behavior by officers, and confirming officers' stories regarding interactions with the public (Alpert and McLean 2018).

prove accountability, and reduce complaints against officers (ManTech Advanced Systems International Inc. 2012).

Advocates of body-worn camera policies as a beneficial reform, and scholars who study the effects of these cameras (see below), focus on two theoretical mechanisms from social psychology: self-awareness and deterrence (Adams and Mastracci 2017; Ariel 2017; Ariel, Farrar, and Sutherland 2015; Ariel et al. 2016b; Ariel et al. 2018; Surette 2005). Both mechanisms involve social surveillance affecting individual behavior due to individual's knowledge that he or she is being watched. The obvious presence of video cameras leads to heightened self-awareness (Duval and Wicklund 1972; Gervais and Norenzayan 2012; Wicklund 1975), which is the process of focusing one's own attention on oneself (Mead 1934), and more socially desirable behavior (Paulhus 1988; Sproull et al. 1996). Scholars find this effect across a variety of specific stimuli, including live audiences, mirrors, and cameras (Buss 1980; Carver and Scheier 1978; Davis and Brock 1975; Davis and Franzoi 1991; Geller and Shaver 1976; Morin 2002) and even species (Chartrand and Bargh 1999; Dzieweczynski, Eklund, and Rowland 2006; Jones and Nesbitt 1971). Being observed creates a greater need to follow rules (Barclay 2004; Milinski, Semmann, and Krambeck 2002; Wedekind and Braithwaite 2002), so people will comply with expected social norms if they know that someone is watching (Morin 2004; Morin 2011; Munger and Harris 1989), even if that someone is an inanimate video camera with no other person able to directly see the footage (Adair 1984; Sherman 1990).

Self-awareness explains a possible mechanism through which the public may constrain police and civilian behavior during interactions between the two, but more self-awareness may prevent police from engaging in inappropriate behavior through a deterrence effect. According to deterrence theory, people are less likely to engage in socially and/or morally unacceptable behavior if the likelihood of being caught and the potential severity of punishment are both high (Nagin 2013; Von Hirsch et al. 1999). Most people prefer to avoid negative consequences, so they will alter their behavior if the chance of experiencing neg-

ative consequences is high (Klepper and Nagin 2006; Nagin 2013). However, there must be apparent signals to suggest that apprehension is likely for the prospect of punishment to deter unacceptable behavior. Affecting the behavior of police officers, operating with wide discretion and little to no supervision, requires a clear mechanism through which they may be caught committing unacceptable acts. Requiring officers to wear a device that records video and audio from their perspective during interactions with civilians likely qualifies as a credible threat of apprehension (Jervis, Lebow, and Stein 1989). Scholars find a similar mechanism regarding cameras and potential criminal offenders (Wikstrom et al. 2012).

Police officers wearing body cameras should be well aware that their actions are being recorded. This self-awareness should encourage officers to engage in behavior they believe to be acceptable. Officers that are more likely to engage in misconduct should also be affected, because cameras introduce a greater likelihood of superiors discovering their misconduct. This combined self-awareness and deterrence effect should lead to fewer uses of lethal force, and fewer civilian deaths, in departments that require the use of body cameras. Additionally, police departments with officers that kill civilians more often should experience a political backlash from citizens under that department's jurisdiction, as unnecessary and excessive use of force violate the social contract, leading to increased tension between the public and police (King and Waddington 2004; Weitzer 2000; Weitzer 2002). Such violations can threaten the public's belief in the legitimacy of police (Westley 1970). The backlash should move from the citizens to their elected officials, then to police leaders[5], and from police leaders it should travel down to the rank-and-file officers. Those departments should pursue body camera programs as a way to constrain officer behavior and show the public a desire to improve accountability. Specifically, my hypotheses are:

Hypothesis 1: Police departments should be more likely to pursue and implement body-worn camera programs as the number of civilians the department's officers kill increases.

[5]In the case of elected sheriffs, political backlash should move directly from citizens to police leadership.

Hypothesis 2: Police departments that adopt body-worn camera programs should kill fewer civilians after implementing the program than departments without a body-worn camera program.

5.4 The State of Research on Body-Worn Cameras

When the salience of body-worn cameras with the public and policymakers greatly increased after the 2014 shooting of Michael Brown (Sanburn 2014; Wasserman 2014), research on their effects was essentially nonexistent. Since then, the study of body-worn cameras accelerated as police departments all over the US implemented body-worn camera programs (Alpert and McLean 2018), and elected officials, police leaders, and scholars realized that such programs were spreading rapidly despite little understanding of how to use these cameras appropriately or the potential for negative consequences (Coudert, Butin, and Le Metayer 2015; Mateescu, Rosenblat, and Boyd 2015). The current state of research on the effects of body-worn cameras is conflicted. The bulk of research uses experimental designs focused on one or a small number of police departments. However, these studies seem to rely upon weak methodology to test the effects of body-worn cameras (Cubitt et al. 2016). The earliest apparent study of body-worn camera effects was a randomized controlled trial in Rialto, CA, which found positive results: the authors reported officers assigned to wear cameras during a shift were less likely to use force, and the number of complaints against officers declined significantly (Ariel, Farrar, and Sutherland 2015; Farrar 2013). Cameras also reduced the use of force in other experimental research (Jennings, Lynch, and Fridell 2015; Owens, Mann, and McKenna 2014). Additional work from outside the US supported the finding that body-worn cameras may reduce civilian complaints, but found no evidence of different treatment of civilians by police (Grossmith et al. 2015).

However, there is also research that finds cameras have no effect on the use of force (Ariel 2017; Ariel et al. 2016b; Katz et al. 2014; Yokum, Ravishankar, and Coppock 2017) and that it increases how frequently police use force (Ariel et al. 2016a). Importantly, Ariel

et al. (2016b) and (Ariel et al. 2018) found a positive effect of body-worn cameras on the likelihood of police officers being the targets of assault, rather than the perpetrators. There is also work that failed to replicate a reduction in complaints against officers (Yokum, Ravishankar, and Coppock 2017). Still more research concludes that cameras reduce citizen complaints about the use of force, but increase the likelihood of complaints against officer misconduct (Ariel 2017). While some claim that improve public perceptions of police, others find mixed results (Cubitt et al. 2016).

Overall evidence of the effects of body-worn cameras on policing is weak (Cubitt et al. 2016), which may explain the wide variation in results. Research primarily relies on experiments or reviews of experiments in one or more locations that likely vary in generalizability. Moreover, several experiments involved what seem to be design choices that introduce potential bias. For example, (Ariel, Farrar, and Sutherland 2015) take the police shift as a unit of analysis, randomly assigning officers to experimental or control shifts. Officers could have worked shifts in both conditions, which could have altered treatment effects. It is also possible that conducting experimental tests of body cameras causes a Hawthorne effect because officers are aware that they are in a treatment group, and their actions are being recorded (Alpert and McLean 2018). Finally, there appears to be little to no research examining why police departments implement body camera programs, likely due to the inability to control conditions that may lead to such implementation experimentally.

In pursuit of evidence for or against body-worn camera effects, observational studies involving police who are not acting as a part of an experiment could also be useful. Aggregating to the police department as the unit of analysis could also be beneficial, because the conflicted findings of prior experimental research–which uses individual officers or shifts as the unite of analysis–may suggest, similar to other findings on the importance of police department culture (Brehm and Gates 1993), that police department culture has an effect on how individual officers behave with or without cameras. However, an observational study requires at least approximate knowledge of when various police departments began

their body-worn camera programs so that the researcher(s) can collect appropriate data on potential causal factors and effects. In the following section, I discuss the Department of Justice's 2015 Body-Worn Camera Pilot Implementation Program, which awarded funding to law enforcement agencies for the implementation of body-worn camera programs, as it provides information on when police departments began these programs, which police departments applied for and received a grant, and the amounts requested and received.

5.4.1 The 2015 Body-Worn Camera Pilot Implementation Program

In 2015 the US Department of Justice announced the Body-Worn Camera Pilot Implementation Program, a competitive grant program that solicited applications from local law enforcement agencies for grant funding to create a body-worn camera program. According to the program's solicitation announcement, the intent was to provide assistance towards developing, implementing, and evaluating body cameras as a way to improve interactions between police and the public and build public trust in police. The program also required grant recipients to develop policies and practices to facilitate the effective adoption of a body camera program that addressed the purchasing and maintenance of equipment, data storage, and concerns over the privacy rights of citizens. The program also required recipients to provide an in-kind or cash match of 50%, with expenses such as data storage costs or expenses incurred by partner programs such as prosecutors. Agencies could apply for a grant under one of four categories. Category 1 included large police departments employing 1,000 or more sworn officers and set a maximum funding request of $1.2 million. Category 2 applied to mid-sized agencies with more than 250 but less than 1,000 sworn officers. This category's maximum request was $600,000. Category 3 applied to small agencies of less than 250 sworn officers, and set a maximum request at $250,000. The Bureau of Justice Assistance expected to make a total of four awards to category 1, twelve to category 2, and sixteen to category 3, providing a mix of department sizes. Agencies were also required to commit to deploying at least 25 cameras total. Category 4 applied to agencies with pre-

existing body camera programs seeking to expand those programs, and limited requests to $250,000. Of a total of 285 applications, fewer than 50 were in category 4 and less than one-third of those applications received awards. While agencies attempting to expand body camera programs could apply for a grant, the program solicitation specified that the focus of the grant was for implementing new body camera programs.

Applications had to include a project abstract of 400 words or less, a program narrative of no more than 20 double-spaced pages, a budget detail worksheet written on a standard form, a budget narrative, a disclosure of the agency's "high risk" status with another federal grant-making agency if applicable, a letter of intent, a timeline of expected milestones, several other standard forms, and a disclosure of agency lobbying activities. The abstract was to be written for a general audience with permission to share the abstract publicly. The program narrative was to include separate sections that stated the problem for which the agency intended the grant, a description of how the agency would design and implement the body camera program, agency capabilities and competencies regarding a body camera program, an explanation of how the agency intended to continue the program beyond the grant, and a plan for collected performance measurements. The budget narrative was to describe each category of expected expense in the detail worksheet, with attention paid to cost effectiveness. For review purposes, the selection criteria consisted of the budget narrative and program narrative only, and each application went through a peer-review process.

285 agencies in 42 states and Washington, DC, applied for a grant through this program. Total requests amounted to more than $56 million. A total of 73 agencies across all four categories received a grant award, exceeding the initial goal of awarding 50 agencies. Award amounts totaled almost $20 million and 21,000 cameras.

I obtained data on applicants and awardees to the programs through a Freedom of Information Act request I submitted to Justice Department's Office of Justice Programs. These data included each applicant, the total amount requested, and the amount awarded for agencies that received an award. The Justice Department announced award winners in Septem-

ber, 2015.

5.5 Data and Methods

I have, essentially, two hypotheses. The first is that agencies responsible for more civilian deaths should have been more likely to apply for, and receive, a grant award. The second is that agencies that apply for, or receive, a grant award should be responsible for fewer deaths later. The dependent variable for the first hypothesis is a binary variable indicating whether an agency received a grant, from the data I obtained through FOIA request. For the second hypothesis, the dependent variable is the number of civilian deaths for which the agency was responsible in 2016, the year after the grant program. I obtained 2016 deaths from the Fatal Encounters database, a project that contains a comprehensive list of civilians killed by police in the US from 2000-2016. The database also includes information about each civilian including age, gender, race, and the agency responsible for the death.

The unit of analysis is the law enforcement agency. To construct the database, I begin with the 2013 Law Enforcement Management and Administrative Statistics survey, which includes about 3,000 law enforcement agencies. I matched the remaining agencies in these data to agencies that pursued and received a body camera grant and to the total civilian deaths of each agency in 2014, 2015, 2016. The dataset contains a total of 2,189 observations, of which 113 applied for a grant and 36 of those received a grant. Summary statistics for all variables are in Table 5.1.

5.5.1 Independent Variables

In the first hypothesis, the primary independent variable is the number of civilian deaths for which the agency was responsible in 2014, the year before the grant program. This measure is also from the Fatal Encounters project. For the second hypothesis, the primary independent variables are binary variables indicating whether an agency applied for, and received, a grant. These measures should capture the theoretical process that I described

previously: agencies that kill more civilians should be more likely to apply for and receive a grant as a response to political backlash from the public. Agencies that apply for and receive a grant should kill fewer civilians in the future, as pursuing a body camera program acts as a signal to street-level officers that the frequent use of lethal force is not an acceptable behavior.

5.5.2 Control Variables

To account for other potential factors that could influence either the likelihood of receiving a grant or the number of civilian deaths, I include several control variables in my analyses.

Amount requested. It seems obvious that a potential factor that could influence whether a police department received a grant is the total amount of money the agency requested. While the program set maximum requests by category, the Justice Department may have been more likely to award grants to agencies requesting smaller amounts, to both minimize the potential loss if an agency failed to implement a body camera program (though there appears to be no evidence of this happening) and to spread available funds around to more awards. To account for this possibility, I use the natural log of the dollar amount each applicant requested.

Racial demographics. Given the recent and highly-salient racial element of the controversies over police use of force in recent years, the grant program could have been a way to signal a desire for more amicable relations between police departments and minority communities. Departments may have been more likely to request and receive a grant if the population within their jurisdiction was less White and, specifically, more Black and Latino/a. To measure minority racial groups, I use the proportion of the population within a police department's jurisdiction that was Latino/a and the proportion that was Black. These data come from American Community Survey estimates.

County-wide jurisdiction. As mentioned previously, the effect of political backlash

should be more direct in the case of law enforcement agencies with elected sheriffs in the lead rather than appointed chiefs, because it avoids the local political officials in the middle. As most police departments with county-wide jurisdiction are sheriff's offices, these agencies she be more responsive to changes in public opinion, such as political responses to relatively frequent civilian deaths. I measure this as a binary variable where 1 indicates the agency has county-wide jurisdiction, from the 2013 LEMAS survey.

Financial flexibility. Though it is hard to imagine any bureaucratic agency preferring to spend its own money rather than someone else's, it is still possible that agencies with considerable financial resources may prefer to pay for the implementation of a body camera program using their own funds rather than apply for a grant that would be subject to Justice Department oversight and various regulations. I could measure financial flexibility as the department's budget, but a more valid measure would be budget dollars for each sworn officer, as that seems to better reflect the concept of flexibility. These data come from the 2013 LEMAS survey.

Previous adoption of camera technology. Some police departments may be more likely to adopt new technology if they already make use of similar technology. Departments that use dash-mounted video cameras, to which proponents of body cameras have often made comparison, might pursue a body-worn camera program due to its similarity and apparent improvement in technology. I measure this as a binary variable indicating whether a police department uses video cameras in patrol cars. This measure comes from the 2013 LEMAS survey, which indicates that about 71% of police departments surveyed use these cameras.

Prior year deaths. When attempting to measure the impact of body camera programs on deaths in the year following receipt of a grant, it seems reasonable to control for the number of people a police department killed in the previous year. Police departments are likely to kill roughly the same number of civilians year to year, *ceteris paribus*, and that number is probably different for different departments. In addition to 2014 deaths by agency

in the model examining factors that affect whether police departments pursue body cameras, I include 2015 deaths, also from the Fatal Encounters project, in the model that examines the effect of receiving a grant on future deaths.

Current body camera program. It seems obvious that police departments that already have body cameras would be less likely to apply for a grant intended to facilitate the implementation of body camera programs, even if the grant program allowed departments to apply for a grant to expand or enhance an existing body camera program. The 2013 LEMAS survey includes a question asking whether police departments use cameras on officers as of January 1, 2013. I code this question as a binary variable.

5.5.3 Model Specification

Because receiving a grant requires police departments to self-select by applying for it, the selection is non-random and statistical modeling must account for the selection process to avoid biased estimates. In the dataset, observations that did not apply for a grant could not receive a grant, so the dependent variable is censored for those observations. I use a Heckman selection model to properly incorporate the two-stage process that results in a truncated dataset[6] (Heckman 1976; Heckman 1979). Essentially, it does so by estimating two models. The first model is a probit that includes all complete agency observations, and the dependent variable is whether the agency applied for a grant. The first stage independent variables are the number of civilians the agency killed in 2014, the population and the proportion of the population that is Black and Latino/a within each agency's jurisdiction in 2014, the agency's budget dollars per full time officer, whether the agency has county-wide jurisdiction, whether the agency currently uses body cameras, and whether the agency currently uses dash cameras in patrol cars. The second model is also a probit[7], includes only

[6]For alternative specifications that involve two separate models, see the appendix.

[7]Similar to Plumper, Schneider, and Troeger (2006), who also use a Heckman selection model to examine self-selected application and accession.

complete observations of agencies that applied for a grant, and the dependent variable is whether an agency received a grant. The independent variables in the second stage include all first stage variables except whether the agency currently uses dash-mounted cameras and body cameras, and adds the natural log of the grant amount the agency requested when applying. In all models, I cluster the standard errors by county to account for unobserved geographic variation.

To determine whether receiving a grant affected the future number of deaths, I use a negative binomial regression, which is appropriate for overly-dispersed count data. The dependent variable is the number of deaths in 2016, the year after the BWCPIP grant program. The independent variables are whether the department received a grant, the number of deaths in 2015, the total population and Black and Latino/a proportions of the populations within each agency's jurisdiction in 2015, the agency's budget dollars per full time officer, and whether the agency as county-wide jurisdiction. This model includes 2,202 police department observations. I also cluster the standard errors of this model by county.

5.6 Results

5.6.1 Effect of Deaths on Pursuit of Body Cameras

The results of the Heckman model are in Table 5.2. Note that the ρ parameter is statistically significant, suggesting the presence of a selection effect. These results offer partial support for my theoretical argument. In the first stage, I find a positive and significant ($p < 0.01$) association between the number of civilians a police department killed in 2014 and the probability of the department applying for the BWCPIP grant in 2015. This suggests support for the theoretical claim that the public applies political pressure to leaders as police officers killed more people and, therefore, violate the social contract between police and the public. Interestingly, I find a negative and significant ($p < 0.000$) association between a department having county-wide jurisdiction and the probability of applying. This suggests that having county-wide jurisdiction reduced the probability of a police department apply-

ing for the grant. It seems plausible that the direct electoral connection between citizens and sheriffs, who are the leaders of most county-wide law enforcement agencies, reduced the agency's need to demonstrate accountability to the public through adopting body cameras, while local elected officials pressured appointed police leaders to pursue these programs to signal that pursuit of accountability.

On a similar note, the Black and Latino/a proportions of populations also had a positive and significant association ($p < 0.000$) with the probability of applying. As these groups are over-represented among police killings, agencies may intend the pursuit and adoption of body camera programs as a way to improve relations between police and those communities, especially when those communities are large enough to be influential voting blocs. There is also a positive and significant association($p < 0.05$) between total population and the probability of applying for a grant. It is possible that, as populations become larger, citizens feel more disconnected from police. The disconnect leads to the pursuit of mechanisms to constrain officer behavior, such as the pursuit of body cameras.

I also find a positive and significant ($p < 0.000$) association between a department's operating budget dollars per officer and the probability of applying for a grant. This relationship is particularly interesting because it is the opposite of my initial expectation. More intuitively, police departments that already used body cameras were significantly less likely to apply ($p < 0.05$). Using cameras in patrol cars did not have any significant effect on the probability of applying.

However, it is impossible to directly interpret the coefficients of a probit model. Substantive interpretation requires the calculation of predicted quantities. Figure 5.1 depicts the marginal effects of each variable on the probability of a police department applying for a BWCPIP grant. Each civilian death in 2014 increased the expected probability of a department applying for a grant by around 0.5%, which supports my theoretical argument that police departments that kill more civilians should be more likely to pursue body camera programs. Although this may seem like a relatively small effect, the largest number of

deaths in the dataset is 32; according to the model, these deaths represent an increase of 16% in the probability that a police department applied for a body camera grant.

The only significant variables in the second stage model are the Black and Latino/a proportions of the population, but both are negative ($p < 0.000$, $p < 0.05$, respectively). This seems to suggest that police departments with larger Black or Latino/a populations were more likely to apply for a grant but less likely to receive a grant. This appears counter-intuitive, but it is possible that only applying for a grant served as a strong enough signal without actually receiving it. Alternatively, officials responsible for deciding award recipients may have acted as agents of another racial group, most likely Whites. The number of 2014 deaths failed to achieve significance, but the significant and positive association in the first stage model means that, potentially, deaths may still have a substantively positive effect on the likelihood of a department receiving a grant if they applied for one.

Again, I cannot directly interpret the coefficients of the model beyond sign and significance. Figure 5.2 depicts the marginal effects of each second stage variable on the conditional probability of a department receiving a grant if it applied for one. Despite the lack of statistical significance in the second stage model, the marginal effect of civilian deaths in 2014 is also positive and significant. Each additional death increased the conditional probability of receiving a grant buy about 8%, again supporting the theoretical argument.

5.6.2 Effects of Grant on Future Deaths

The second question of interest is what, if any, effect receiving a BWCPIP grant has on future civilian deaths. Table 5.3 depicts the results. Most importantly, the model shows a positive and significant ($p < 0.000$) association between receiving a grant and the number of people police departments killed in the following year[8]. This finding contradicts the theoretical expectation that receiving a grant to facilitate the implementation of a body

[8]Estimating the model with the variable indicating whether a police department applied for a grant, rather than whether it received the grant, yields similar results. See the appendix.

camera program would trigger increased self-awareness and deterrence effects that would constrain police officer behavior and result in fewer deaths. Instead, receiving the grant seems to have led to more deaths.

The Black and Latino/a population proportions in 2015, the number of civilian deaths in 2015, and budget dollars per officer are also positive and significantly ($p < 0.000$) associated with the number of civilian deaths in 2016. Having county-wide jurisdiction is significant and negative ($p < 0.01$). The total population did not achieve significance.

Figure 5.3 displays total civilian deaths averaged across police departments, by whether the department applied and received a BWCPIP grant. Among police departments that did not apply for a grant, civilian deaths remained, on average, almost zero across all three years. Civilian deaths associated with police departments that applied for, but did not receive, a grant begin slightly higher than departments that did not apply and increase slightly in 2015 and 2016, but the change is quite small. However, for departments that applied and received a grant, deaths were considerably higher–at an average of almost three per department in 2014. Deaths declined to around two per department in 2015, the year of the grant program, before increasing again to around 2.5 per department in 2016, the year after the department received the grant.

The trend shown in this graph, like the model results, contradict the theoretical expectation of the effect of body cameras on future deaths. These results seem to suggest that applying for and receiving a grant to implement body cameras served as little more than a method of virtue signaling: it allowed police departments to communicate to the public that they favored improving transparency and accountability among police officers without a resulting decrease in deaths except for the year in which the grant program occurred.

5.7 Conclusion

This paper represents what may be the first attempt at a study of police body cameras in two ways. First, I attempt to examine what factors increase police departments' motivation

to implement body-worn camera programs. I argue that police pursue body camera programs as a response to public backlash that increases with the number of civilians police kill. The public empowers police with the lawful authority to use force, including lethal force, but expects police to use force, especially lethal force, only when absolutely necessary and only in least amount necessary to accomplish lawful goals such as maintaining public order. When police become more militarized, they see the use of force as more acceptable or even more desirable, which creates a principal-agent problem between citizens and the police and leads police to use force, including lethal force, more often. This results in more frequent civilian deaths and a political backlash from the public, which leads police departments to pursue policy changes intended to improve transparency and accountability and placate the public.

Second, I contribute to the emerging literature on the effects of body cameras by examining the effect the implementation of body camera programs has on future civilian deaths. I argue, consistent with a robust literature in social psychology, that knowledge that one is being watched leads to heightened self-awareness. That self-awareness, combined with an increased chance of being caught and punished for engaging in unacceptable behavior, creates a deterrent effect that should constrain police officer behavior. As street-level bureaucrats who typically operate unsupervised in the field, forcing the use of devices that record audio and video of civilian interactions should present a strong signal that inappropriate behavior will result in punishment, which would create a new incentive to avoid using force except when necessary.

To test these arguments, I take advantage of the Justice Department's 2015 Body-Worn Camera Pilot Implementation Program, a competitive grant that allowed law enforcement agencies to request funding to implement or expand a body-worn camera program. Using a Heckman selection model to account for the effects of self-selection by choosing to apply for a grant, my results suggest partial support for my theoretical argument. The number of deaths in the prior year seems to have had a positive and significant effect on the likelihood

of a police department applying for and receiving a grant through this program. However, receiving a grant not only seems to have failed to reduce future civilian deaths, I find a positive association between the two: police departments in 2016, the year after the grant program, killed more people if they received an award than if they did not.

It is plausible that this is, still, a matter of street-level discretion. Even if police departments implement a body-worn camera program, the effectiveness of such a program–in other words, whether body cameras really cause increased self-awareness and deter undesirable behavior— depends on whether the video recordings actually serve as a means to "catch" and then sanction officers for engaging in undesirable behavior. Otherwise, body cameras become, at best, a tool to facilitate gathering evidence against civilians for criminal prosecution but not against police officers for the same and, at worst, a cynical tactic to improve police legitimacy without leading to any positive effects, such as changing the behaviors that damaged that legitimacy in the first place. As recent events have shown, police still generally receive a great deal of deference to their decisions within the criminal justice system, even when video evidence seems to show clearly inappropriate behavior (McBride and Winsor 2016; Chavez, Egel, and Chabria 2018). An important caveat to note is that this observational study, while sacrificing less generalizability than prior body camera research, sacrifices more causality than the experimental design-driven work of criminology scholars over the last several years. Overall, research on all aspects of body-worn cameras is still in its infancy, and scholars may eventually reach a consensus that body cameras produce positive effects. But, considering many police department policies specifically prohibit or limit the use of body camera footage to evaluate and/or discipline officers (Fan 2018), it seems unlikely that body camera programs will lead to any significant reduction in deaths.

Table 5.1 Chapter 5 Summary Statistics

Variable	Min	Mean	Max	Std. Deviation
Awarded Grant	0	0.319	1	0.468
Applied for Grant	0	0.052	1	0.221
2014 Deaths	0	0.314	32	1.483
2015 Deaths	0	0.291	33	1.358
2016 Deaths	0	0.306	21	1.201
2014 Population (divided by 10,000)	0.009	11.865	997.420	40.125
2015 Population (divided by 10,000)	0.010	12.021	1003.839	40.451
Percent Black (2014)	0	11.920	97.300	15.900
Percent Black (2015)	0	11.995	96.400	15.979
Percent Latino/a (2014)	0	13.637	100	17.267
Percent Latino/a (2015)	0	13.807	100	17.358
Budget Per Officer (divided by 10,000)	1.917	13.403	140.00	7.773
Amount Requested (logged)	8.700	11.967	13.998	1.196
Current Body Camera Program	0	0.295	1	0.456
Dash Cameras	0	0.743	1	0.437

Table 5.2 Heckman Probit, effect of deaths on probability of applying for grant

	Probit model	Selection model
2014 Deaths	0.092(0.069)	0.076(0.028)**
2014 Population (divided by 10,000)	-0.002(0.001)	0.002(0.001)*
Percent Black (2014)	-0.023(0.006)***	0.017(0.002)***
Percent Latino/a (2014)	-0.015(0.006)*	0.008(0.002)***
Budget Per Officer (divided by 10,000)	-0.020(0.016)	0.021(0.006)***
Countywide	0.105(0.503)	-0.793(0.175)***
Amount Requested (logged)	0.116(0.085)	-
Current Body Camera Program	-	-0.282(0.114)*
Dash Cameras	-	0.171(0.107)
(Intercept)	0.760(1.256)	-2.324(0.145)***
ρ	-0.812(0.197)*	
N	2,189 (113 uncensored)	
$***< 0.001$, $**< 0.01$, $*< 0.05$		
Wald $\chi^2(7)$ = 26.36	$Prob. > \chi^2$ = 0.000	
DV = Whether department received grant		
Selection = Whether department applied for grant		

Table 5.3 NB Regression, effect of receiving grant on future deaths

	Estimate
Awarded Grant	1.008(0.272)***
2015 Deaths	0.464(0.063)***
2015 Population (divided by 10,000)	0.006(0.005)
Percent Black (2015)	0.020(0.003)***
Percent Latino/a (2015)	0.012(0.003)***
Budget Per Officer (divided by 10,000)	0.042(0.009)***
Countywide	-0.448(0.166)**
(Intercept)	-2.898(0.151)***
ln(Alpha)	0.752(0.123)***
N	2,189

$***< 0.001$, $**< 0.01$, $*< 0.05$
Wald $\chi^2(7)$ = 260.81
$Prob. > \chi^2$ = 0.000
DV = Number of deaths in 2016

5.9 Figures

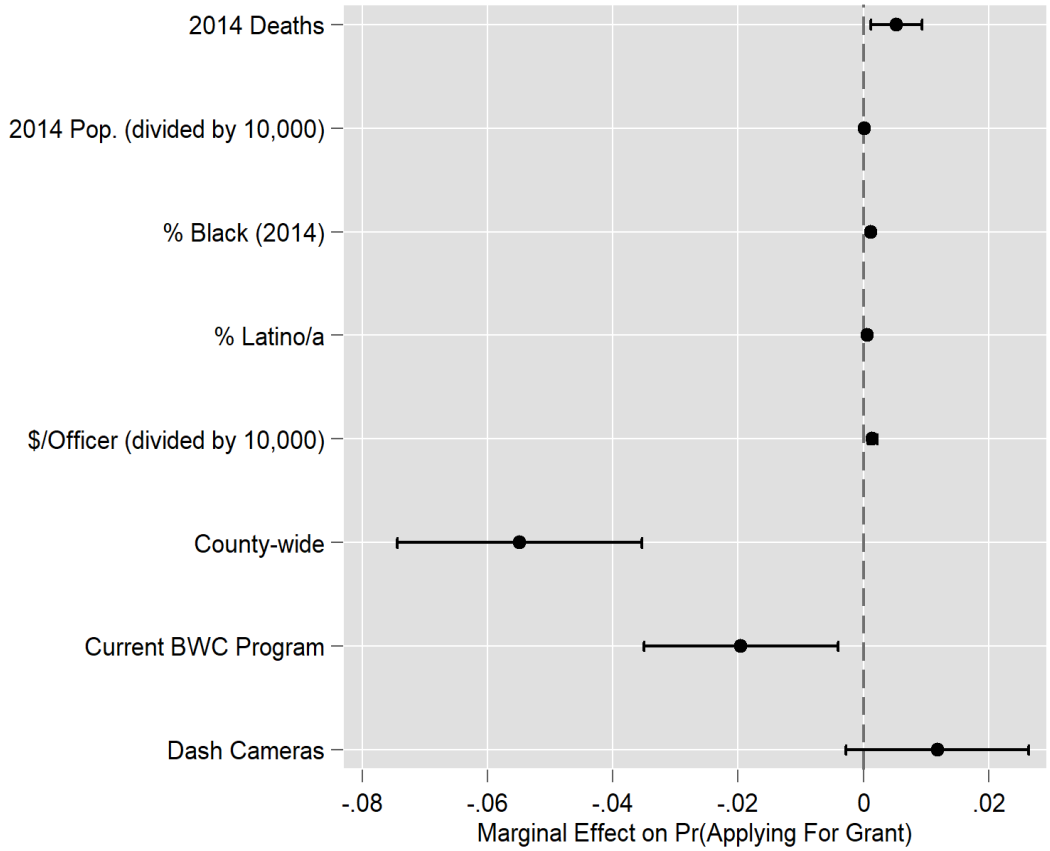

Figure 5.1 Marginal effects of variables on Pr(Applied)

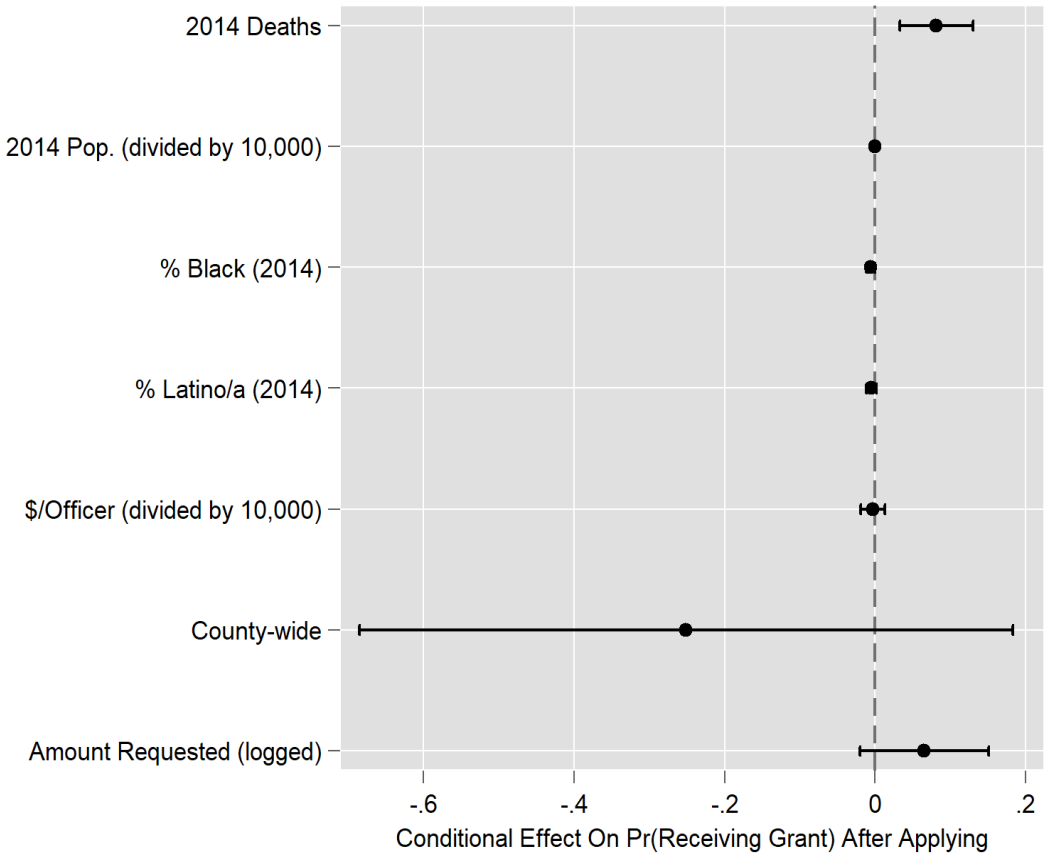

Figure 5.2 Marginal effects of variables on Pr(Received | Applied)

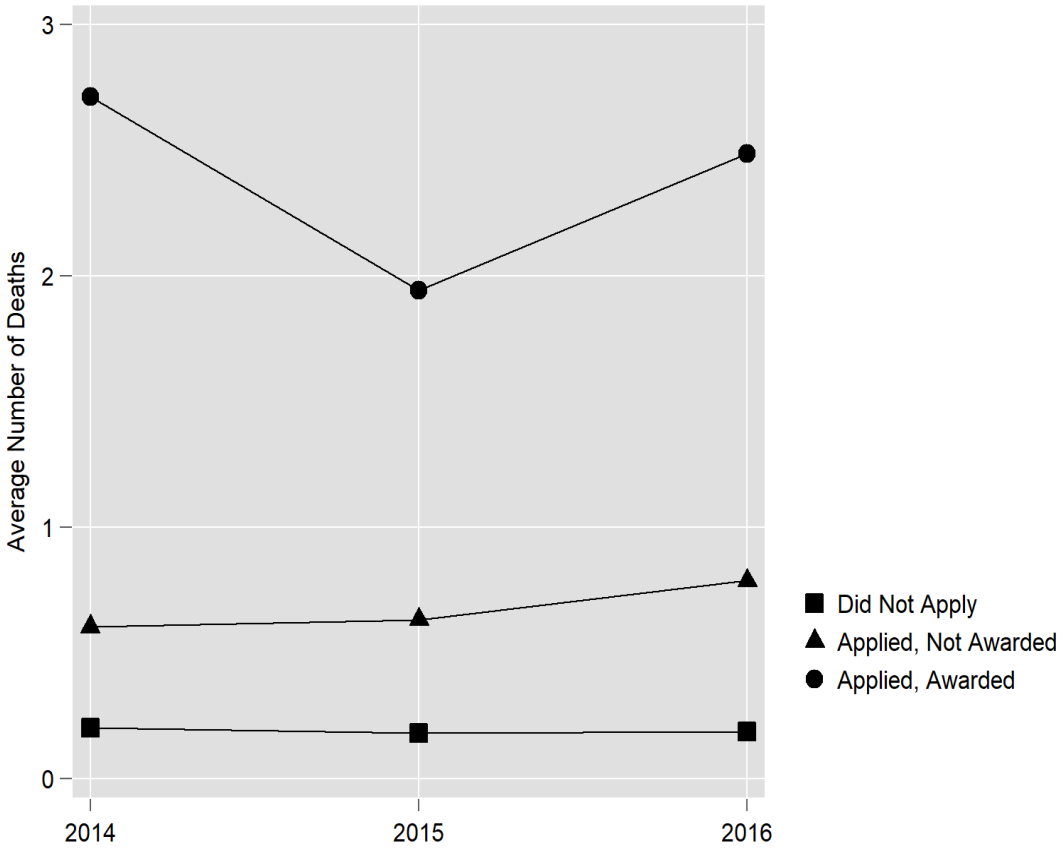

Figure 5.3 Average civilian deaths, by grant status, 2014-2016

Chapter 6

Conclusion

In the preceding chapters, I walked through a theory and empirical tests of the causes and consequences of police militarization. Chapter 1 described several high-profile incidents of civilian deaths under questionable or outright illegal circumstances at the hands of police. These incidents, and the many others since the shooting of Michael Brown in 2014, set off a debate over the role of police, what behaviors are unacceptable or not, what militarization actually is, what whether militarization is responsible for the string of killings that brought policing to such a salient position in the public. Chapter 2 provided an overview of my theory, defined militarization, and explained the way I operationalize both militarization and police killings. Chapter 3 presented the first part of my argument in detail and performed an empirical test. In Chapter 3, I argue that militarization is a police response to increased threat they perceive from minority racial groups within their jurisdiction. In short, I argue that police militarize more as the non-White proportion of the population within their jurisdiction increases. However, I also argue this relationship should reverse once the minority proportion reaches a critical mass, a size at which the minority group is large enough to affect police behavior. In Chapter 4, I argue that militarization affects police officer behavior by shifting their preferences in interactions with civilians toward more violence, leading to lethal force more quickly and more often. The result is that more militarized police should kill more people. Finally, in Chapter 5, I argue that militarized police using lethal force when it is not necessary violates a social contract between police and the public. The public should demand policy changes to constrain police behavior and facilitate a better ability to monitor police officers. Given the high salience of body-worn

video cameras, those are a likely choice of policy solution. Further, police departments that adopt body cameras should kill fewer people.

Empirically, I find support for much of my argument. Analyses in Chapter 3 find a positive association between the non-White, specifically Black and Latino/a, population proportions and militarization, but the association becomes negative once those proportions reach a certain size–around 50% for non-White and Latino/a, and around 36% for Black. In Chapter 4, I find a positive association between militarization and the number of civilians police kill. As my theory argued, more militarized police kill more people. Chapter 5 tests two questions: whether police that kill more people are more likely to pursue, and implement, body camera programs, and whether police departments that adopt body camera programs kill fewer police in the future. Results in this chapter are mixed. I find a positive association between the number of civilians a police department killed in 2014 and the probability that the department applied for a Body-Worn Camera Pilot Implementation Program grant in 2015. In addition, I find a positive association between the number of civilian deaths in 2014 and the probability that a department received a grant. However, I also find that police departments that received a grant in 2015 killed more civilians in 2016, not fewer.

To sum up, police militarize when the populations they serve are less White, specifically more Black and/or Latino/a, until the minority proportion(s) reach a large enough size to affect police behavior to their benefit. Militarized police departments kill more people. Police departments that kill more people are more likely to pursue body camera policies to signal a desire for greater transparency and accountability to the public, but police seem to take the adoption of body cameras as essentially no threat. It is plausible that police use body cameras as a public relations move rather than a sincere attempt to reduce unnecessary force. Regardless, police departments that received a BWCPIP grant in 2015 killed more civilians in 2016, all else equal.

These findings make important contributions to the study of policing. First, they provide

empirical evidence to support claims of racial bias in policing and militarization. Second, they also provide evidence to inform the debate on the use of force by police. Third, my results include one of, if not the, first attempts to examine the reasons police departments implement body camera policies. Fourth, I provide what may be the first national study of the effects of body cameras using observational data rather than a randomized controlled trial.

A common thread weaving through many discussions of these topics is the legitimacy of police agencies. We empower police with significant authority to take away the rights of citizens, up to and including the right to life. Police behavior that appears associated with militarization, such as racial bias and the unnecessary and excessive use of force, undermine that legitimacy and threaten police departments' ability to perform their function in society. Law enforcement in any society is a necessary endeavor. Governments of all types enact laws to promote collective benefits such as stability and safety. Policing is an important part of that. But police also have important responsibilities in addition to their authority and discretion: they must carry out their duties with the minimum amount of violence and disruption necessary so that in protecting safety and stability they do not inadvertently threaten both. As scholars of politics and government, political scientists must discover the factors that affect police behavior and how to mitigate negative behavior, because police are a fundamental arm of government and, therefore, of society. This dissertation provides a foundation for that study, but considerable work remains.

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Appendix A

Supplemental Materials for Chapter 3

A.1 Alternative Model Specifications

This section presents the results of alternative specifications of Models 1 and 2. Table A.1 depicts the results of a negative binomial model. The results of this model largely supports those of the main analysis; the association between the non-White proportion and militarization is curvilinear, positive initially but becoming negative as the proportion grows larger. The Latino/a proportion follows a similar pattern. While the association of the Black proportion with militarization is positive, it is not significant. The squared term, however, is negative and significant.

The results of A.2 offer additional, though also partial, support for the results of the main analysis in Poisson regression models. The association between the non-White proportion and militarization is similarly curvilinear, as is the association between the Latino/a proportion and militarization. The Black proportion loses significance and the signs of both terms are reversed. However, given the highly over-dispersed nature of the dependent variable, the negative binomial model is more appropriate. This is likely the cause of the loss of significance. Zero-inflated Poisson regression models, in Tables A.3 and A.4, offer similar results to the Poisson regressions. The non-White proportion's association is curvilinear, as is the association of the Latino/a proportion, but again the Black proportion is insignificant.

Recall that the zero-inflated negative binomial regression assumes two zero-generation processes. In the case of the 1033 program, those are 1) a police department does not join the program and 2) a police department joins the program but does not request equipment.

Though I justify the use of a ZINB model by explaining the low cost of joining the 1033 program, it may seem unlikely that a department would join the program and then not take advantage of it. Alternatively, a hurdle regression model assumes only one zero-generation process. This model assumes that any police officer that joins the 1033 program will receive equipment, and the zeros are agencies that do not join the program. Tables A.5 and A.6 depict the results of two hurdle regressions. The non-White proportion's association remains curvilinear, as does the Black proportion. The Latino/a proportion's association with militarization becomes insignificant.

Finally, Table A.7 shows the results of OLS regression models with standard errors clustered by county. The results are substantively similar to those of the hurdle regressions. However, it is worth noting that the nature of the dependent variable means essentially all assumptions of the OLS regression model are violated. This model is included for the sake of completeness only.

A.2 Alternative DV Transformations

The models in this section use different transformations of the dependent variable, militarization represented by the value of 1033 program equipment. Table A.8 depict logit models with a binary dependent variable, where observations where militarization is greater than 0 are coded as 1, 0 otherwise. The non-White proportion's association remains curvilinear, but coefficients are not sigificant. Similarly, the specific racial groups are also not significant. This seems to suggest that racial demographics may not affect whether a police department militarizes at all, though previous results suggest that demographics affect the extent to which police departments militarize.

Table A.9 shows an OLS regression model with the natural log of the militarization measure as the dependent variable. The results for the non-White proportion remain the same, but the specific racial groups are insignificant. While it may seem more appropriate to use this model in the main analysis due to its simplicity, I do not for several reasons. First,

a log transformation means that the original variable must increase by larger and larger amounts as it grows larger to affect the natural log's value. If the value of military equipment represents the same "amount" of militarization regardless of how much equipment a police department already has, then a log transformation is inappropriate. Second, taking the natural log of zero is impossible, so including the zeros requires adding one dollar to every observation. Essentially, this eliminates all zeros from the models. Those zeros are important theoretically because they represent no militarization; eliminating them seems counterproductive. Finally, calculating predicted values from a logged dependent variable is more difficult. I use models that, while more complicated, allow for the generation of more easily-understood predicted values.

Finally, to compare my measure of militarization with at least one alternative measure that does not involve 1033 program equipment, I ran a negative binomial regression using the variables of the general threat model, but with the dependent variable as the number of SWAT team deployments in Maryland during 2014. Maryland state law required law enforcement agencies to track data on SWAT team deployments during the state's fiscal years 2010, 2011, 2012, 2013, and 2014. I obtained these data and merged the FY 2014 SWAT deployments with my data on agencies in Maryland in 2014. The SWAT data include over 800 deployments from 31 agencies. Unfortunately, due to missing agencies from the LEMAS survey data, there are only 15 usable observations. The results of the negative binomial regression are in Table A.10. These results largely match the substantive conclusions of the main analysis. I find a positive, significant ($p < 0.05$) association between the non-White population proportion and the number of SWAT deployments in Maryland in 2014. The squared term is also negative and significant ($p < 0.05$), which matches the results from the general threat model in the main analysis. While I must recognize that the SWAT deployment data include only one state and result in only 15 complete observations, this at least offers some level of support for my theory.

A.3 Appendix A Tables

Alternative Model Specifications

Table A.1 NB Regressions, General and Specific Threat models

	General Threat model	Specific Threat model
Percent Non-White	0.063(0.011)***	-
Percent Non-White^2	-0.001(0.000)***	-
Percent Black	-	0.022(0.013)
Percent Black^2	-	-0.000(0.000)*
Percent Latino/a	-	0.059(0.012)***
Percent Latino/a^2	-	-0.001(0.000)***
Percent Asian	-	0.032(0.042)
Percent Asian^2	-	-0.001(0.001)
South	0.578(0.157)***	0.680(0.164)***
Population (divided by 10,000)	0.008(0.004)*	0.006(0.005)
Percent Poverty	-0.015(0.014)	-0.011(0.014)
Violent Crime Rate	0.005(0.003)	0.009(0.004)*
Budget Per Officer (divided by 10,000)	0.036(0.010)***	0.030(0.011)**
Countywide	0.559(0.194)**	0.688(0.229)**
Ideology	-0.055(0.328)	-0.332(0.355)
(Intercept)	0.812(0.370)*	1.126(0.380)**
N	2,135	2,135
$***< 0.001, **< 0.01, *< 0.05$		
Wald $\chi^2(9)$ = 60.42	Wald $\chi^2(13)$ = 124.66	
$Prob. > \chi^2$	0.000	0.000
DV = Militarization (in 10,000s)		

Table A.2 Poisson Regressions, General and Specific Threat models

	General Threat model	Specific Threat model
Percent Non-White	0.085(0.024)***	-
Percent Non-White^2	-0.001(0.000)***	-
Percent Black	-	-0.003(0.020)
Percent Black^2	-	0.000(0.000))
Percent Latino/a	-	0.065(0.022)**
Percent Latino/a^2	-	-0.001(0.000)**
Percent Asian	-	0.119(0.062)
Percent Asian^2	-	-0.004(0.003)
South	-0.020(0.287)	0.343(0.211)
Population (divided by 10,000)	0.002(0.004)***	0.001(0.001)
Percent Poverty	-0.036(0.021)	-0.019(0.025)
Violent Crime Rate	0.010(0.003)**	0.011(0.004)**
Budget Per Officer (divided by 10,000)	0.022(0.007)**	0.011(0.007)
Countywide	1.156(0.303)***	1.400(0.338)***
Ideology	-0.111(0.291)	-0.521(0.342)
(Intercept)	0.815(0.440)	1.180(0.444)**
N	2,135	2,135
$***< 0.001, **< 0.01, *< 0.05$		
Wald $\chi^2(9)$ = 395.85	Wald χ^{13} = 403.63	
$Prob. > \chi^2$	0.000	0.000
DV = Militarization (in 10,000s)		

Table A.3 ZIP Regression, General Threat model

	Count Model	Zero-Inflation model
Percent Non-White	0.079(0.023)**	-0.013(0.011)
Percent Non-White^2	-0.001(0.000)***	0.000(0.000)
South	-0.161(0.268)	-0.527(0.170)**
Population (divided by 10,000)	0.002(0.000)***	-0.001(0.001)
Percent Poverty	-0.038(0.024)	0.015(0.013)
Violent Crime Rate	0.009(0.004)*	-0.006(0.003)
Budget Per Officer (divided by 10,000)	0.017(0.007)*	-0.020(0.010)*
Countywide	0.970(0.300)**	-0.438(0.191)*
Ideology	0.018(0.280)	0.213(0.304)
(Intercept)	1.691(0.411)***	0.415(0.347)
N	2,135 (814 zeros)	
$***< 0.001$, $**< 0.01$, $*< 0.05$		
Wald $\chi^2(9)$ = 263.99	$Prob. > \chi^2$ = 0.000	
DV = Militarization (in 10,000s)		

Table A.4 ZIP Regression, Specific Threat model

	Count Model	Zero-Inflation model
Percent Black	0.003(0.018)	0.010(0.014)
Percent Black^2	-0.000(0.000)	0.000(0.000)
Percent Latino/a	0.066(0.020)**	-0.005(0.012)
Percent Latino/a^2	-0.001(0.000)***	0.000(0.000)
Percent Asian	0.105(0.063)	0.001(0.032)
Percent Asian^2	-0.003(0.003)	-0.000(0.001)
South	0.166(0.194)	-0.707(0.182)***
Population (divided by 10,000)	0.001(0.001)*	-0.001(0.001)
Percent Poverty	-0.023(0.026)	0.012(0.013)
Violent Crime Rate	0.010(0.004)*	-0.009(0.004)*
Budget Per Officer (divided by 10,000)	0.007(0.007)	-0.018(0.010)
Countywide	1.178(0.330)***	-0.467(0.208)*
Ideology	-0.310(0.336)	0.430(0.334)
(Intercept)	1.973(0.447)***	0.275(0.338)
N	2,135 (814 zeros)	
$***< 0.001$, $**< 0.01$, $*< 0.05$		
Wald $\chi^2(13)$ = 330.19	$Prob. > \chi^2$ = 0.000	
DV = Militarization (in 10,000s)		

Table A.5 Hurdle Regression, General Threat model

	Regression Model	Selection model
Percent Non-White	0.052(0.017)**	0.009(0.007)
Percent Non-White^2	-0.001(0.000)**	-0.000(0.000)
South	0.587(0.227)*	0.324(0.104)**
Population (divided by 10,000)	0.005(0.001)***	0.000(0.001)
Percent Poverty	0.027(0.020)	-0.009(0.008)
Violent Crime Rate	0.008(0.004)	0.004(0.002)
Budget Per Officer (divided by 10,000)	0.036(0.013)**	0.012(0.006)*
Countywide	0.687(0.256)**	0.273(0.118)*
Ideology	-0.205(0.437)	-0.135(0.183)
(Intercept)	-0.802(0.501)	-0.253(0.210)
N	2,135	
$***< 0.001, **< 0.01, *< 0.05$		
Wald $\chi^2(9)$ = 75.29	$Prob. > \chi^2$ = 0.000	
DV = Militarization (in 10,000s)		

Table A.6 Hurdle Regression, Specific Threat model

	Regression Model	Selection model
Percent Black	0.041(0.019)*	-0.006(0.009)
Percent Black^2	-0.001(0.000)**	-0.000(0.000)
Percent Latino/a	0.023(0.018)	0.003(0.007)
Percent Latino/a^2	-0.000(0.000)	-0.000(0.000)
Percent Asian	0.049(0.052)	0.001(0.020)
Percent Asian^2	-0.001(0.001)	-0.000(0.000)
South	0.644(0.253)*	0.431(0.110)***
Population (divided by 10,000)	0.004(0.001)**	0.000(0.001)
Percent Poverty	0.030(0.019)	-0.007(0.008)
Violent Crime Rate	0.011(0.005)*	0.005(0.002)*
Budget Per Officer (divided by 10,000)	0.033(0.015)*	0.011(0.006)
Countywide	0.846(0.281)**	0.291(0.127)*
Ideology	-0.319(0.449)	-0.261(0.200)
(Intercept)	-0.656(0.459)	-0.169(0.205)
N	2,135	
$***< 0.001, **< 0.01, *< 0.05$		
Wald $\chi^2(13)$ = 90.90	$Prob. > \chi^2$ = 0.000	
DV = Militarization (in 10,000s)		

Table A.7 OLS Regressions, General and Specific Threat models

	General Threat model	Specific Threat model
Percent Non-White	1.749(0.737)*	-
Percent Non-White^2	-0.015(0.006)**	-
Percent Black	-	-0.397(0.528)
Percent Black^2	-	0.005(0.010)
Percent Latino/a	-	1.905(0.933)*
Percent Latino/a^2	-	-0.020(0.009)*
Percent Asian	-	3.526(2.592)
Percent Asian^2	-	-0.084(0.060)
South	0.322(9.448)	10.332(7.046)
Population (divided by 10,000)	0.405(0.125)**	0.355(0.132)**
Percent Poverty	-0.728(0.603)	-0.233(0.531)
Violent Crime Rate	0.213(0.110)	0.307(0.141)*
Budget Per Officer (divided by 10,000)	0.984(0.457)*	0.626(0.367)
Countywide	30.505(12.451)*	39.011(16.230)*
Ideology	0.207(11.129)	-8.472(12.855)
(Intercept)	-38.572(16.122)*	-40.229(20.043)*
N	2,135	2,135
$***< 0.001, **< 0.01, *< 0.05$		
R^2	0.091	0.098
	F(9, 598) = 6.06	F(13, 598) = 4.38
	$Prob. > F$ = 0.000	$Prob. > F$ = 0.000

DV = Militarization (in 10,000s)

Table A.8 Logit with binary militarization dependent variable

	General Threat model	Specific Threat model
Percent Non-White	0.013(0.011)	-
Percent Non-White^2	-0.000(0.000)	-
Percent Black	-	-0.010(0.014)
Percent Black^2	-	-0.000(0.000)
Percent Latino/a	-	0.005(0.012)
Percent Latino/a^2	-	-0.000(0.000)
Percent Asian	-	-0.001(0.032)
Percent Asian^2	-	0.000(0.001)
South	0.527(0.170)**	0.707(0.182)***
Population (divided by 10,000)	0.001(0.001)	0.001(0.001)
Percent Poverty	-0.015(0.013)	-0.012(0.013)
Violent Crime Rate	0.006(0.003)	0.009(0.004)*
Budget Per Officer (divided by 10,000)	0.020(0.010)*	0.018(0.010)
Countywide	0.438(0.191)*	0.468(0.208)*
Ideology	-0.213(0.304)	-0.430(0.334)
(Intercept)	-0.415(0.347)	-0.275(0.338)
N	2,135	2,135
$***<0.001$, $**<0.01$, $*<0.05$		
Wald χ^2	(9) 26.25	(13) 30.98
$Prob. > \chi^2$	0.001	0.003
Pseudo R^2	0.024	0.026
DV = Militarization (0=0, >0=1)		

Table A.9 OLS Regressions with logged militarization dependent variable

	General Threat model	Specific Threat model
Percent Non-White	0.066(0.031)*	-
Percent Non-White^2	-0.001(0.000)*	-
Percent Black	-	-0.001(0.040)
Percent Black^2	-	-0.001(0.001)
Percent Latino/a	-	0.025(0.032)
Percent Latino/a^2	-	-0.000(0.000)
Percent Asian	-	0.046(0.091)
Percent Asian^2	-	-0.001(0.002)
South	1.709(0.464)***	2.201(0.486)***
Population (divided by 10,000)	0.005(0.003)	0.005(0.003)
Percent Poverty	-0.023(0.034)	-0.012(0.034)
Violent Crime Rate	0.021(0.009)*	0.028(0.010)**
Budget Per Officer (divided by 10,000)	0.071(0.025)**	0.065(0.026)*
Countywide	1.610(0.534)**	1.795(0.565)**
Ideology	-0.677(0.822)	-1.231(0.899)
(Intercept)	2.898(0.919)**	3.294(0.885)***
N	2,135	2,135
$***< 0.001, **< 0.01, *< 0.05$		
	R^2 = 0.093	R^2 = 0.061
	F(9, 598) = 8.20	F(13, 598) = 5.05
	$Prob. > F$ = 0.000	$Prob. > F$ = 0.000
DV = log(Militarization)		

Table A.10 NB Regressions, General threat model only

	Estimate
Percent Non-White	0.330(0.140)*
Percent Non-White^2	-0.005(0.002)*
Population (divided by 10,000)	-0.053(0.013)***
Percent Poverty	-0.120(0.037)**
Violent Crime Rate	0.149(0.049)**
Budget Per Officer (divided by 10,000)	-0.057(0.030)
Countywide	5.574(1.700)**
Ideology	-1.449(1.037)
(Intercept)	-7.219(3.461)*
ln(Alpha)	-2.99(0.955)
N	15
$***< 0.001, **< 0.01, *< 0.05$	
Wald $\chi^2(9)$ = 952.67	
$Prob. > \chi^2$	0.000
DV = Number of SWAT deployments in 2014	

Appendix B

Supplemental Materials for Chapter 4

B.1 Alternative Transformation of Militarization

Some may object to measuring militarization by simply dividing the cumulative dollar amount of 1033 program equipment by 10,000. It is plausible that a log transformation would be preferable for this variable. I include the same zero-inflated negative binomial model, but with militarization measured by the natural log of the inflation-adjusted dollar value of military hardware received by the agency in each year, plus one[1]. Results of this model are in Table B.1. Most importantly, militarization remains positive and significant ($p < 0.05$) in the count model. However, militarization does not achieve significance in the zero-inflation model.

Additionally, while I argue that the inflation-adjusted dollar value of equipment an agency receives through the 1033 program represents varying levels of militarization (in other words, police departments who become more collectively militarized will desire and request more expensive equipment), it is also plausible that more militarized departments will simply request more equip-ment in general. Thus, the value of the equipment is less important, especially considering the average officer is much less likely to use more expensive equipment. For example, while police departments may obtain mine-resistant, ambush-protected vehicles, or MRAPs, which are worth approximately $600,000, the likelihood

[1] I add one to all totals because many of the observations for this variable are zeros, and the natural log of a zero is undefined. When dealing with such large dollar amounts, a single dollar makes little substantive difference and allows me to take the natural log of all observations. Additionally, adding one to the entire vector does not change the fundamental pattern of the vector.

of the average officer being able to use such a vehicle is probably very low. On the other hand, the average officer may be much more likely to use lower-valued equipment such as helmets, body armor, boots, weapons, etc. Thus, I run additional models with militarization represented by the total number of items (lagged by one quarter) an agency re-ceived through the 1033 program, a binary variable indicating whether an agency received an item worth $50,000 or more, and a binary variable indicating whether an agency received an item worth $100,000 or more[2].

The results of these models are in Tables B.2, B.3, and B.4, respectively. In Table B.2, the total number of items received is not significant in the count model but has a negative and significant ($p < 0.05$) association in the zero-inflation model. This suggests that agencies that receive more items are less likely to kill zero suspects in a quarter, but total items have no effect on the total number of suspects killed. In Table B.3, receiving at least one item valued at $50,000 or more has a positive and significant ($p < 0.05$) association with the number of suspects killed, but not in the zero-inflation model. Finally, in Table B.4, receiving at least one item valued at $100,000 or more is also positive and significantly ($p < 0.001$) associated with higher numbers of suspect deaths, but not in the zero-inflation model.

Tables B.5 and B.6 combine these two alternative measures. In Table B.5, I include both the total number of items received and the binary variable indicating whether an agency received an item valued at $50,000 or more. In Table B.6, I include the total number of items and whether an agency received an item valued at $100,000 or more. In both tables, the high-value item variable is significant and positive in the count model ($p < 0.01$ in Table B.5, $p < 0.001$) in Table B.6), while the total number of items is not significant. Neither variable is significant in the zero-inflation model of Table B.5, but both the $100,000 indicator and the total number of items are significant in the zero-inflation model of Table B.6

[2]$50,000 and $100,000 represent roughly the top 5% and the top 2% of items in the raw 1033 program data by inflation-adjusted value.

($p < 0.001$ and $p < 0.05$, respectively).

Table B.7 depicts the results of another alternative measure of militarization. In this model, I use a binary variable from the 2013 Law Enforcement Management and Administrative Statistics that indicates whether a police department has a team that engages in "tactical operations"–in other words, whether the department has a Special Response Team (also know as a Special Weapons and Tactics or SWAT team). This measure is closer to the definition of militarization according to Kraska and others. However, the results suggest that the presence of one of these teams in a department is not significantly related to suspect deaths.

Taken together, the results of these models seem to suggest that dollar values–and particularly, higher valued items, are capturing an effect that a simple count of items does not. The results contribute further support to my argument that the dollar value acts as a better proxy for militarization than other potential measures despite the fact that many officers within a department may not directly use or interact with some items the agency receives.

B.2 Alternative Model Specifications

As robustness checks, I also estimate several additional statistical models using the data from the main analysis. Table B.8 depicts the results of a negative binomial regression. This result adds further support to the results of the main analysis, as militarization has a positive and significant ($p < 0.01$) association with suspect deaths. While the likelihood ratio test of alpha in the zero-inflated negative binomial and the negative binomial models show overdispersion in the dependent variable ($p < 0.001$), which leads to the conclusion that negative binomial models are more appropriate for the data than Poisson models, I run a zero-inflated Poisson regression and a Poisson regression for further robustness checks. These results are in Tables B.9 and B.10, respectively. The militarization variable just barely fails to achieve significance in the zero-inflated Poisson model ($p = 0.056$) but is significant and positive in the Poisson regression model ($p < 0.001$).

I also run OLS regressions with two-way random effects (Table B.11) and with standard errors clustered by agency (Table B.12). The results of the random effects regression support the main analysis, as militarization is again positive and significant ($p < 0.001$). In the OLS model with clustered standard errors, militarization again barely fails significant ($p = 0 : 053$). While these models are not necessarily appropriate for the data, they can serve as additional robustness checks to show that the results hold across several model specifications.

B.3 Endogeneity

One major issue with this analysis is the potential for an endogenous relationship between militarization and the use of lethal force. It is possible that a higher frequency of suspect deaths could drive militarization as a response to fear of retaliation or simply due to the expectation of violent encounters in the future. Then, militarization may lead to an increase in the killing of suspects, creating a sort of feedback loop. An endogenous relationship such as this would call all of the previous results into question.

I ran all of the previous models with the militarization variable lagged by one quarter as an attempt to compensate for endogeneity, but further effort seems necessary in order to determine whether it is present. To test for endogeneity, I ran models using the militarization variable from the main analysis as the dependent variable. The level of analysis remains the agency-quarter. As explanatory variables, I use the number of people police in a particular agency killed in a particular quarter, which I lagged by one quarter, as well as all control variables from the main analysis. Table B.13 shows the results of an OLS regression with standard errors clustered by agency. Most importantly, these results indicate that the lagged number of deaths has no statistically significant effect on militarization.

To further test the possibility of endogeneity, I also estimated a regression with agency and time random effects in order to better account for unobserved effects that are due to agency-specific or time-specific factors. Results of this model are in Table B.14. These re-

sults also show that the number of deaths has no significant effect on future militarization. Taken together, these two additional models suggest rejecting the potential of an endogeneous relationship between the use of lethal force and militarization.

B.4 Alternative Time Scale

Finally, the main analysis uses quarterly data as it is the most disaggregated data available on both militarization and incidents of suspect deaths. This may lead to the potential for bias if there is little variation in either variable from quarter to quarter. In addition, the control variables do not change from quarter to quarter. In order to test for bias introduced by using quarterly data, I aggregated the data to agency-year observations, using the average level of militarization (lagged by one year) and the total number of suspect deaths for each year. These results are in Table B.15. Most importantly, militarization is positive and significant in its association with suspect deaths ($p < 0.001$).

B.5 Appendix B Tables

B.5.1 Alternative Transformation of Militarization

Table B.1 ZINB Regression with natural log of militarization

	Count model	Zero-Inflation model
Log Militarization (lagged)	0.090(0.040)*	-0.011(0.066)
Population (divided by 10,000)	0.005(0.002)*	-0.213(0.063)***
Percent Poverty	0.004(0.017)	-0.006(0.022)
Percent Latino/a	0.013(0.009)	0.008(0.013)
Percent Black	0.004(0.005)	-0.002(0.007)
Violent Crime Rate	0.020(0.008)*	0.007(0.014)
Budget per Officer (divided by 10,000)	-0.001(0.021)	-0.021(0.053)
Countywide	-1.531(0.215)***	-0.755(0.452)
(Intercept)	-1.489(0.531)**	3.331(0.717)***
ln(Alpha)	-0.851(0.726)	
N	11,848	
$***< 0.001$, $**< 0.01$, $*< 0.05$		
Wald chi^2 = 213.85	$Prob. > chi^2 = 0.000$	
DV = Number of suspect deaths		

Table B.2 ZINB Regression with the total number of items received

	Count model	Zero-Inflation model
Total Items Received (lagged)	0.000(0.000)	-0.007(0.003)*
Population (divided by 10,000)	0.005(0.002)*	-0.208(0.046)***
Percent Poverty	0.005(0.016)	-0.004(0.021)
Percent Latino/a	0.013(0.008)	0.007(0.010)
Percent Black	0.004(0.006)	-0.003(0.008)
Violent Crime Rate	0.025(0.009)**	0.014(0.015)
Budget per Officer (divided by 10,000)	-0.000(0.016)	-0.019(0.033)
Countywide	-1.537(0.212)***	-0.755(0.421)
(Intercept)	-1.362(0.437)**	3.367(0.549)***
ln(Alpha)	-0.843(0.595)	
N	11,848	
$***< 0.001, **< 0.01, *< 0.05$		
Wald chi^2 = 190.53	$Prob. > chi^2 = 0.000$	
DV = Number of suspect deaths		

Table B.3 ZINB Regression, received high value item as militarization

	Count model	Zero-Inflation model
Received High-Value Item (above $50k, lagged)	0.404(0.158)*	0.211(0.265)
Population (divided by 10,000)	0.005(0.002)*	-0.220(0.055)***
Percent Poverty	0.004(0.016)	-0.006(0.021)
Percent Latino/a	0.011(0.008)	0.006(0.011)
Percent Black	0.004(0.005)	-0.002(0.008)
Violent Crime Rate	0.020(0.009)*	0.005(0.014)
Budget per Officer (divided by 10,000)	0.000(0.014)	-0.017(0.030)
Countywide	-1.568(0.194)***	-0.819(0.389)*
(Intercept)	-1.471(0.477)**	3.290(0.520)***
ln(Alpha)	-0.814(0.614)	
N	11,848	
$***< 0.001$, $**< 0.01$, $*< 0.05$		
Wald chi^2 = 183.63	$Prob. > chi^2$ = 0.000	
DV = Number of suspect deaths		

Table B.4 ZINB Regression, received high-value item (alternative level) as militarization

	Count model	Zero-Inflation model
Received High-Value Item (above $100k, lagged)	0.601(0.158)***	0.291(0.305)
Population (divided by 10,000)	0.005(0.002)**	-0.216(0.035)***
Percent Poverty	0.010(0.015)	0.001(0.019)
Percent Latino/a	0.012(0.006)*	0.008(0.009)
Percent Black	0.002(0.005)	-0.005(0.007)
Violent Crime Rate	0.021(0.007)**	0.007(0.013)
Budget per Officer (divided by 10,000)	0.003(0.012)	-0.014(0.022)
Countywide	-1.579(0.186)***	-0.829(0.371)*
(Intercept)	-1.577(0.374)***	3.131(0.469)***
ln(Alpha)	=1.005(0.499)*	
N	11,848	
$***< 0.001, **< 0.01, *< 0.05$		
Wald chi^2 = 236.64	$Prob. > chi^2$ = 0.000	
DV = Number of suspect deaths		

Table B.5 ZINB Regression with the total number of items received and a high-value item dummy variable

	Count model	Zero-Inflation model
Total Items Received (lagged)	-0.000(0.000)	-0.007(0.004)
Population (divided by 10,000)	0.005(0.002)*	-0.213(0.046)***
Percent Poverty	0.007(0.017)	-0.001(0.022)
Percent Latino/a	0.012(0.008)	0.007(0.010)
Percent Black	0.004(0.006)	-0.003(0.008)
Violent Crime Rate	0.021(0.008)*	0.012(0.015)
Budget per Officer (divided by 10,000)	-0.000(0.016)	-0.019(0.036)
Countywide	-1.563(0.217)***	-0.824(0.448)
Received High-Value Item (above $50k, lagged)	0.398(0.151)**	0.384(0.279)
(Intercept)	-1.540(0.451)**	3.367(0.549)***
ln(Alpha)	-0.807(0.543)	
N	11,848	
$***< 0.001, **< 0.01, *< 0.05$		
Wald chi^2 = 201.36	$Prob. > chi^2 = 0.000$	
DV = Number of suspect deaths		

Table B.6 ZINB Regression with the total number of items received and an alternate high-value item dummy variable

	Count model	Zero-Inflation model
Total Items Received (lagged)	-0.000(0.000)	-0.007(0.003)*
Population (divided by 10,000)	0.005(0.002)**	-0.211(0.030)***
Percent Poverty	0.013(0.015)	0.006(0.020)
Percent Latino/a	0.012(0.006)*	0.008(0.008)
Percent Black	0.002(0.005)	-0.006(0.008)
Violent Crime Rate	0.021(0.007)**	0.013(0.014)
Budget per Officer (divided by 10,000)	0.003(0.012)	-0.015(0.022)
Countywide	-1.586(0.195)***	-0.845(0.397)*
Received High-Value Item (above $100k, lagged)	0.619(0.148)***	0.473(0.311)
(Intercept)	-1.644(0.377)***	3.066(0.487)***
ln(Alpha)	-0.977(0.446)*	
N	11,848	
$***< 0.001$, $**< 0.01$, $*< 0.05$		
Wald chi^2 = 249.29	$Prob. > chi^2 = 0.000$	
DV = Number of suspect deaths		

Table B.7 ZINB Regression with SWAT team dummy variable

	Count model	Zero-Inflation model
SWAT Team	0.726(0.462)	-0.317(0.433)
Population (divided by 10,000)	0.005(0.002))**	-0.186(0.045)***
Percent Poverty	0.004(0.016)	-0.008(0.021)
Percent Latino/a	0.012(0.007)	0.005(0.010)
Percent Black	0.004(0.006)	-0.001(0.007)
Violent Crime Rate	0.021(0.008)**	0.003(0.012)
Budget per Officer (divided by 10,000)	-0.001(0.012)	-0.017(0.027)
Countywide	-1.471(0.199)***	-0.793(0.391)*
(Intercept)	-1.994(0.558)***	3.393(0.627)***
ln(Alpha)	-0.780(0.513)	
N	13,329	
$***< 0.001$, $**< 0.01$, $*< 0.05$		
Wald chi^2 = 146.78	$Prob. > chi^2 = 0.000$	
DV = Number of suspect deaths		

Table B.8 NB Regression, effect of militarization on civilian deaths

	Estimate
Militarization (lagged, divided by 10,000)	0.003(0.001)**
Population (divided by 10,000)	0.016(0.004)***
Percent Poverty	0.001(0.007)
Percent Latino/a	0.014(0.003)***
Percent Black	0.016(0.003)***
Violent Crime Rate	0.003(0.007)
Budget per Officer (divided by 10,000)	0.028(0.010)**
Countywide	-0.834(0.162)***
(Intercept)	-3.756(0.182)***
N	11,848
$***< 0.001$, $**< 0.01$, $*< 0.05$	
Wald chi^2 = 91.37	$Prob. > chi^2$ = 0.014
Pseudo R^2	0.139
DV = Number of suspect deaths	

Table B.9 ZIP Regression, effect of militarization on civilian deaths

	Count model	Zero-Inflation model
Militarization (lagged, divided by 10,000)	0.001(0.000)	-0.002(0.002)
Population (divided by 10,000)	0.004(0.001)***	-0.172(0.214)***
Percent Poverty	-0.001(0.015)	-0.012(0.019)
Percent Latino/a	0.015(0.004)**	0.011(0.006)
Percent Black	0.005(0.005)	-0.001(0.007)
Violent Crime Rate	0.018(0.009)	0.003(0.013)
Budget per Officer (divided by 10,000)	-0.012(0.009)	-0.047(0.022)*
Countywide	-1.602(0.205)***	-0.743(0.396)
(Intercept)	-0.889(0.334)**	3.927(0.452)***
N	11,848	
$***< 0.001, **< 0.01, *< 0.05$		
Wald chi^2 = 330.38	$Prob. > chi^2 = 0.000$	
DV = Number of suspect deaths		

Table B.10 Poisson Regression, effect of militarization on civilian deaths

	Estimate
Militarization (lagged, divided by 10,000)	0.002(0.001)***
Population (divided by 10,000)	0.004(0.001)***
Percent Poverty	-0.003(0.008)
Percent Latino/a	0.024(0.003)***
Percent Black	0.024(0.004)***
Violent Crime Rate	-0.007(0.010)
Budget per Officer (divided by 10,000)	0.019(0.006)***
Countywide	-0.782(0.231)***
(Intercept)	-3.462(0.160)***
N	11,848
$***< 0.001$, $**< 0.01$, $*< 0.05$	
Wald chi^2 = 187.66	$Prob. > chi^2$ = 0.000
Pseudo R^2	0.192
DV = Number of suspect deaths	

Table B.11 Regression with two-way random effects, effect of militarization on civilian deaths

	Estimate
Militarization (lagged, divided by 10,000)	0.001(0.000)***
Population (divided by 10,000)	0.006(0.000)***
Percent Poverty	0.001(0.001)
Percent Latino/a	0.001(0.000)**
Percent Black	-0.000(0.000)
Violent Crime Rate	0.001(0.001)
Budget per Officer (divided by 10,000)	-0.001(0.001)
Countywide	-0.123(0.015)***
(Intercept)	0.021(0.021)
N	11,848
$***< 0.001, **< 0.01, *< 0.05$	
R^2	0.295
Wald chi^2 = 1466.52	$Prob. > chi^2$ = 0.000
DV = Number of suspect deaths	

Table B.12 OLS Regression, effect of militarization on civilian deaths

	Estimate
Militarization (lagged, divided by 10,000)	0.001(0.001)
2012 Population	0.006(0.001)***
Percent Poverty	0.001(0.001)*
Percent Hispanic	0.001(0.000)**
Percent Black (not Hispanic)	-0.000(0.000)
Violent Crime Rate	0.001(0.001)
2013 Operating Budget (per officer, in 10,000s)	-0.001(0.001)
Countywide	-0.123(0.022)***
(Intercept)	0.020(0.017)
N	11,848
$***< 0.001, **< 0.01, *< 0.05$	
R^2	0.295
F = 11.18	$Prob. > F$ = 0.000
DV = Number of suspect deaths	

B.5.3 Endogeneity

Table B.13 OLS Regression, effect of civilian deaths on future militarization

	Estimate
Deaths (lagged)	21.599(13.095)
Population (divided by 10,000)	0.366(0.111)**
Percent Poverty	-0.254(0.140)
Percent Latino/a	0.100(0.063)
Percent Black	0.046(0.077)
Violent Crime Rate	0.739(0.180)***
Budget per Officer (divided by 10,000)	0.280(0.245)
Countywide	7.568()3.003)*
(Intercept)	3.396(3.737)
N	11,848
$***< 0.001, **< 0.01, *< 0.05$	
R^2	0.158
F = 6.36	$Prob. > F$ = 0.000
DV = Militarization (in 10,000 2016 dollars)	

Table B.14 Regression with two-way random effects, effect of civilian deaths on future militarization

	Estimate
Deaths (lagged)	0.093(0.355)
Population (divided by 10,000)	0.506(0.037)***
Percent Poverty	-0.192(0.179)
Percent Latino/a	0.130(0.080)
Percent Black	0.047(0.094)
Violent Crime Rate	0.714(0.171)***
Budget per Officer (divided by 10,000)	0.249(0.193)
Countywide	4.923(3.205)
(Intercept)	3.704(4.284)
N	11,848
$***< 0.001, **< 0.01, *< 0.05$	
R^2	0.137
Wald chi^2 = 251.68	$Prob. > chi^2$ = 0.000
DV = Militarization (in 10,000 2016 dollars)	

B.5.4 Alternative Time Scale

Table B.15 ZINB Regression with annual averages

	Count model	Zero-Inflation model
Militarization (lagged, divided by 10,000)	0.011(0.002)***	0.007(0.003)*
Population (divided by 10,000)	0.013(0.004)***	-0.576(0.114)***
Percent Poverty	0.015(0.015)	0.002(0.027)
Percent Latino/a	0.003(0.004)	-0.007(0.008)
Percent Black (not Hispanic)	0.002(0.005)	-0.002(0.010)
Violent Crime Rate	0.027(0.009)**	0.008(0.016)
Budget per Officer (divided by 10,000)	0.017(0.009)	-0.012(0.021)
Countywide	-1.176(0.195)***	-0.158(0.466)
(Intercept)	-1.319(0.308)***	2.395(0.530)***
ln(Alpha)	0.689(0.136)***	
N	2,962	

$***< 0.001$, $**< 0.01$, $*< 0.05$
Wald $chi^2(8)$ = 88.35 $Prob. > chi^2$ = 0.000
DV = Number of suspect deaths

Appendix C

Supplemental Materials for Chapter 5

C.1 Alternative Model Specifications - Hypothesis 1

This section discusses the results of alternative model specifications relating to Hypothesis 1, which examine the effect of civilian deaths on the probability that a police department applied for or received a BWCPIP grant in 2015. Although the ρ parameter in the Heckman probit model is significant, suggesting the presence of a selection effect and, therefore, the necessity of using a sample-selection model, I performed robustness checks in the form of separating the Heckman model into separate constituent models. The results of these models are in Tables C.1 through C.7.

Table C.1 displays the results of a scobit regression including only police departments that applied for a grant. The dependent variable is a binary variable where 1 indicates the police department received a grant, 0 otherwise. This variable is skewed, with only 36 police departments in the sample receiving a grant. A scobit relaxes the assumption that independent variable effects are strongest at a probability of 0.5, so the results of this model could help support the ultimate conclusion of the main analysis. The results indicate that they do. I find a positive, significant ($P < 0.001$) association between the number of civilian deaths in 2014 and the probability of a police department receiving a grant. Tables C.2 and C.3 show the results of a logit and probit analysis, respectively, of the same variables and observations. These models also support the substantive finding of the main analysis with regard to civilian deaths: they show a positive and significant ($p < 0.01$) association between the number of deaths in 2014 and the probability of a police department receiving

a grant.

Tables C.4 and C.5 repeat the analysis as logit and probit models, respectively, including censored observations as well as uncensored. These models also support the substantive findings. The models show a positive association between the number of civilian deaths in 2014 and the probability of a police department receiving a grant. In each model, the number of deaths is statistically significant ($p < 0.01$, $p < 0.001$, respectively). Civilian deaths seem to have a positive impact on the probability of receiving a grant, given the positive and significant associations across multiple model specifications.

Finally, Tables C.6 and C.7 depict the results of alternate specifications of the selection model from the main analysis, measuring the effect of the independent variables on the probability that a police department applied for a BWCPIP grant. In each, I find a positive and significant ($p < 0.05$, $p < 0.01$, respectively) association between 2014 deaths and the probability of applying for a grant. These models seem to offer support for the substantive findings of the selection model. Overall, these alternative models support the substantive findings of the main analysis.

C.2 Alternative Model Specifications - Hypothesis 2

This section discusses the results of alternative model specifications that test Hypothesis 2. This hypothesis predicted that police departments that received a grant would kill fewer civilians in the following year. In the main analysis, the results suggest the opposite: I find that police departments that received a BWCPIP grant killed more people in 2016 than departments that did not receive a grant. As the dependent variable is an event count, I ran a series of alternative event count models as robustness checks. Tables C.8 and C.10 depict Poisson and zero-inflated Poisson regressions, respectively. In these models, receiving a grant had no significant effect on the number of deaths in the following year.

However, the significance of the alpha parameter in the main analysis suggests that the dependent variable is over-dispersed, which could explain the lack of significant findings

in Poisson models. I also estimated a zero-inflated Negative Binomial regression model as an additional check. The results of this model offer support for the substantive findings of the main analysis: I find a positive, significant ($p < 0.05$) association between receiving a grant and the number of future deaths. Though this result does not support the initial hypothesis, it does offer support for the contradictory finding.

Finally, Tables C.11 and C.12 estimate Negative Binomial and Poisson models, respectively, that replicate the model in the main analysis but only include the observations of police departments that applied for a grant. The results also support the findings of the main analysis. In each model, there is a positive and significant ($p < 0.01$, $p < 0.001$, respectively) association between receiving a grant and the number of future civilian deaths.

C.3 Appendix C Tables

C.3.1 Alternative Model Specifications - Hypothesis 1

Table C.1 Scobit Regression, effect of deaths on probability of receiving grant, uncensored observations only

	Estimate
2014 Deaths	0.265(0.070)***
2014 Population (divided by 10,000)	-0.002(0.002)
Percent Black (2014)	-0.026(0.011)*
Percent Latino/a (2014)	-0.018(0.013)
Budget Per Officer (divided by 10,000)	0.015(0.043)
Current Body Camera Program	-0.537(0.437)
Dash Cameras	0.902(0.778)
Countywide	-1.376(1.171)
Amount Requested (logged)	0.241(0.172)
(Intercept)	-18.979(2.533)***
ln(Alpha)	14.918(0.678)***
N	113

$***< 0.001, **< 0.01, *< 0.05$

DV = Whether department received grant

Table C.2 Logit Regression, effect of deaths on probability of receiving grant, uncensored observations only

	Estimate
2014 Deaths	0.335(0.101)**
2014 Population (divided by 10,000)	-0.002(0.002)
Percent Black (2014)	-0.031(0.014)*
Percent Latino/a (2014)	-0.022(0.016)
Budget Per Officer (divided by 10,000)	0.006(0.046)
Current Body Camera Program	-0.701(0.554)
Dash Cameras	0.924(0.851)
Countywide	-1.500(1.320)
Amount Requested (logged)	0.302(0.213)
(Intercept)	-4.292(2.731)
N	113

$***< 0.001$, $**< 0.01$, $*< 0.05$

Wald $\chi^2(8)$ = 20.71

Prob. $> \chi^2$ = 0.014

DV = Whether department received a grant

Table C.3 Probit Regression, effect of deaths on probability of receiving grant, uncensored observations only

	Estimate
2014 Deaths	0.207(0.061)**
2014 Population (divided by 10,000)	-0.001(0.001)
Percent Black (2014)	-0.018(0.008)*
Percent Latino/a (2014)	-0.013(0.009)
Budget Per Officer (divided by 10,000)	0.000(0.025)
Current Body Camera Program	-0.416(0.328)
Dash Cameras	0.466(0.439)
Countywide	-0.743(0.670)
Amount Requested (logged)	0.177(0.123)
(Intercept)	-2.423(1.540)
N	113

$***< 0.001$, $**< 0.01$, $*< 0.05$

Wald $\chi^2(8)$ = 23.58

Prob. $> \chi^2$ = 0.005

DV = Whether department received a grant

Table C.4 Logit Regression, effect of deaths on probability of receiving grant, all observations

	Estimate
2014 Deaths	0.212(0.068)**
2014 Population (divided by 10,000)	0.003(0.001)*
Percent Black (2014)	0.020(0.006)***
Percent Latino/a (2014)	0.011(0.007)
Budget Per Officer (divided by 10,000)	0.036(0.010)***
Current Body Camera Program	-1.242(0.632)*
Dash Cameras	0.966(0.510)
Countywide	-2.745(1.062)
(Intercept)	-5.537(0.544)***
N	2,189

$***< 0.001$, $**< 0.01$, $*< 0.05$
Wald $\chi^2(8)$ = 59.32
Prob. $> \chi^2$ = 0.000
DV = Whether department received a grant

Table C.5 Probit Regression, effect of deaths on probability of receiving grant, all observations

	Estimate
2014 Deaths	0.115(0.032)***
2014 Population (divided by 10,000)	0.001(0.001)*
Percent Black (2014)	0.010(0.003)***
Percent Latino/a (2014)	0.004(0.003)
Budget Per Officer (divided by 10,000)	0.017(0.006)**
Current Body Camera Program	-0.441(0.215)*
Dash Cameras	0.345(0.201)
Countywide	-0.993(0.371)**
(Intercept)	-2.761(0.222)***
N	2,189

$***< 0.001$, $**< 0.01$, $*< 0.05$

Wald $\chi^2(8)$ = 60.42

Prob. $> \chi^2$ = 0.000

DV = Whether department received a grant

Table C.6 Logit Regression, effect of deaths on probability of applying for grant

	Estimate
2014 Deaths	0.133(0.059)*
2014 Population (divided by 10,000)	0.004(0.001)**
Percent Black (2014)	0.033(0.005)***
Percent Latino/a (2014)	0.017(0.004)***
Budget Per Officer (divided by 10,000)	0.039(0.013)**
Current Body Camera Program	-0.621(0.280)*
Dash Cameras	0.307(0.235)
Countywide	-1.875(0.442)***
(Intercept)	-4.202(0.317)***
N	2,189

$***< 0.001$, $**< 0.01$, $*< 0.05$
Wald $\chi^2(7)$ = 111.26
Prob. $> \chi^2$ = 0.000
DV = Whether department applied for grant

Table C.7 Probit Regression, effect of deaths on probability of applying for grant

	Estimate
2014 Deaths	0.078(0.029)**
2014 Population (divided by 10,000)	0.002(0.001)*
Percent Black (2014)	0.017(0.002)***
Percent Latino/a (2014)	0.008(0.002)***
Budget Per Officer (divided by 10,000)	0.021(0.006)***
Current Body Camera Program	-0.270(0.123)*
Dash Cameras	0.145(0.112)
Countywide	-0.790(0.175)***
(Intercept)	-2.303(0.144)***
N	2,189

$***< 0.001$, $**< 0.01$, $*< 0.05$
Wald $\chi^2(7)$ = 115.81
Prob. $> \chi^2$ = 0.000
DV = Whether department applied for grant

Table C.8 Poisson Regression, effect of receiving grant on future deaths

	Estimate
Awarded Grant	0.812(0.420)
2015 Deaths	0.107(0.015)***
2015 Population (divided by 10,000)	0.002(0.001)*
Percent Black (2015)	0.021(0.003)***
Percent Latino/a (2015)	0.017(0.002)***
Budget Per Officer (divided by 10,000)	0.030(0.006)***
Countywide	-0.568(0.168)**
(Intercept)	-2.342(0.136)***
N	2,189

$***< 0.001, **< 0.01, *< 0.05$
Wald $\chi^2(7)$ = 339.24
Prob. $> \chi^2$ = 0.000
DV = Number of deaths in 2016

Table C.9 ZINB Regression, effect of receiving grant on future deaths

	Count model	Zero-Inflation model
Awarded Grant	0.550(0.242)*	0.532(1.091)
2015 Deaths	0.268(0.043)***	-1.025(0.355)**
2015 Population (divided by 10,000)	0.001(0.001)	-0.379(0.093)***
Percent Black (2015)	0.004(0.004)	-0.024(0.009)**
Percent Latino/a (2015)	-0.002(0.004)	-0.026(0.015)
Budget Per Officer (divided by 10,000)	0.011(0.008)	-0.008(0.014)
Countywide	-0.561(0.192)**	1.862(0.682)**
(Intercept)	-0.801(0.223)***	3.180(0.355)***
ln(Alpha)	-0.282(0.149)	
N	2,189 (1,863 zeros)	

$***< 0.001$, $**< 0.01$, $*< 0.05$
Wald $\chi^2(7)$ = 78.25
Prob. $> \chi^2$ = 0.000
DV = Number of deaths in 2016

Table C.10 ZIP Regression, effect of receiving grant on future deaths

	Count model	Zero-Inflation model
Awarded Grant	0.339(0.291)	-0.327(0.847)
2015 Deaths	0.101(0.012)***	-1.122(0.309)***
2015 Population (divided by 10,000)	0.000(0.001)	-0.171(0.068)*
Percent Black (2015)	0.003(0.004)	-0.018(0.007)*
Percent Latino/a (2015)	-0.000(0.004)	-0.018(0.009)
Budget Per Officer (divided by 10,000)	0.010(0.007)	-0.014(0.012)
Countywide	-0.771(0.237)**	1.164(0.459)*
(Intercept)	-0.124(0.199)	3.167(0.309)***
N	2,189 (1,863 zeros)	

$***< 0.001$, $**< 0.01$, $*< 0.05$
Wald $\chi^2(7)$ = 131.85
Prob. $> \chi^2$ = 0.000
DV = Number of deaths in 2016

Table C.11 NB Regression, effect of receiving grant on future deaths, uncensored observations only

	Estimate
Awarded Grant	0.782(0.291)**
2015 Deaths	0.191(0.084)*
2015 Population (divided by 10,000)	-0.001(0.002)
Percent Black (2015) 0.013(0.007)*	
Percent Latino/a (2015)	0.007(0.007)
Budget Per Officer (divided by 10,000)	0.038(0.026)
Countywide	-1.744(0.994)
(Intercept)	-1.569(0.547)**
ln(Alpha)	-0.053(0.299)
N	113

$***< 0.001, **< 0.01, *< 0.05$

Wald $\chi^2(7)$ = 41.65

Prob. $> \chi^2$ = 0.000

DV = Number of deaths in 2016

Table C.12 Poisson Regression, effect of receiving grant on future deaths, uncensored observations only

	Estimate
Awarded Grant	0.977(0.271)***
2015 Deaths	0.078(0.022)***
2015 Population (divided by 10,000)	0.000(0.002)
Percent Black (2015)	0.013(0.007)
Percent Latino/a (2015)	0.013(0.008)
Budget Per Officer (divided by 10,000)	0.028(0.023)
Countywide	-1.804(1.019)
(Intercept)	-1.404(0.563)*
N	113

$***< 0.001$, $**< 0.01$, $*< 0.05$
Wald $\chi^2(7)$ = 108.21
Prob. $> \chi^2$ = 0.000
DV = Number of deaths in 2016